NOVEMBER 8, 1954

NEWS ISSUE

# Electrical World

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A McGRAW-HILL PUBLICATION

—"What a crazy life for a grandmother"

see page 15

*Oldest section of AIEE, the Chicago Section founded in 1893, is host to the Fall General Meeting...page 28*

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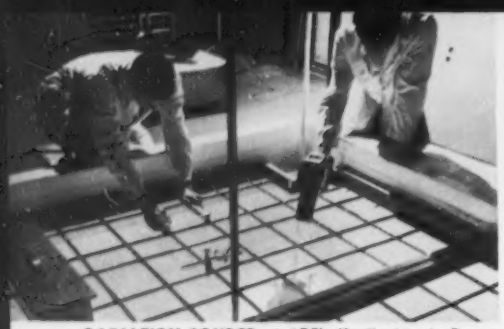
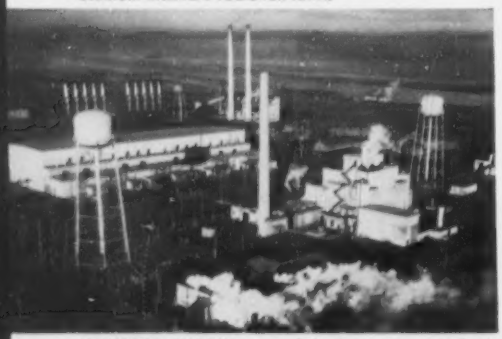
E & POWER

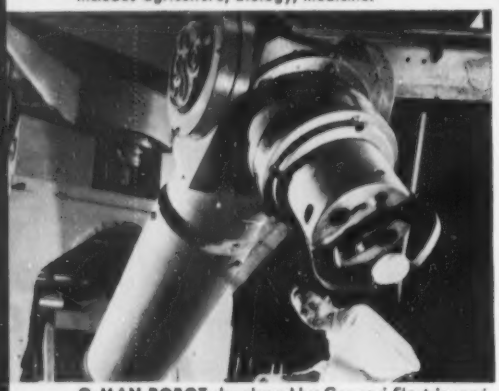
Industrial Relations . . . page 55



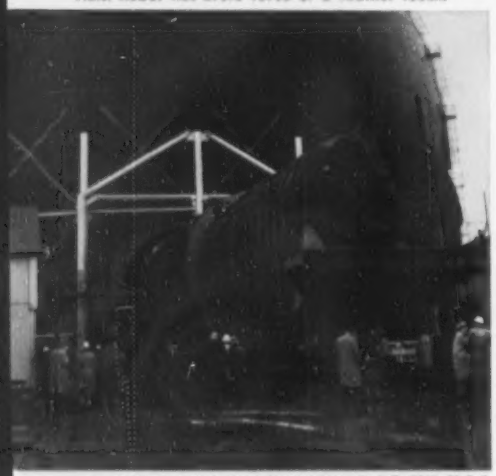
**RADIATION SOURCE** at AEC's Knolls Atomic Power Laboratory is more than twice world's radium supply. G-E scientist at KAPL studies condition of source while assistant monitors radiation level.



**HANFORD WORKS,** one of the largest reactor facilities in the world, has been run for the AEC by General Electric since 1946. Atomic research now includes agriculture, biology, medicine.



**O-MAN ROBOT** developed by General Electric engineers for the joint AEC-Air Force Aircraft Nuclear Propulsion Program safely handles radioactive materials. Robot has brute force or a feather touch.



**ATOMIC SUBMARINE PROTOTYPE OF THE U.S.S. "SEA WOLF"** rolls into protective steel sphere at West Milton, N. Y. G-E reactor being readied for Navy may be Navy's marine propulsion power plant of the future.

**DIAGRAMS OF NUCLEAR REACTORS**—boiling light water reactor and graphite moderated reactor—both suited to create electricity from atomic power are here being studied by Francis K. McCune (right), gen. mgr., G.E.'s Atomic Products Division, and Bruce Prentice, manager, G-E Atomic Power Study.

## Here's a look behind the scenes at

# Civilizing atomic power

Economy and ample power station capacity highlight the story behind today's prediction of utility-owned atomic power plants in five years.

Critical examination by General Electric's Atomic Power Study group shows that conventionally fueled plants may soon have active atomic competition—particularly in areas of relatively high cost generation and in large plants.

Analysis of capital charges, operating and fuel costs gives encouraging evidence of atomic power's future role. Moreover, recent legislation has given new impetus to atomic development by private industry.

### RESULTS OF ATOMIC RESEARCH

Findings of G.E.'s Atomic Power Study provide a sound basis for the prediction of economic atomic power within the next five years. These findings, including anticipated production costs, are backed up by 14 years of G-E experience in many phases of atomic activity, as well as an evaluation of the status of reactor development at various AEC laboratories. This G-E atomic "Task Force" is presently concentrating on the technological problems involved, including a "long burn-up" fuel element.

G.E.'s participation in atomic energy activities was initiated in 1940 when two G-E physicists were among the first to isolate U-235. Today some 4000 G-E specialists, supported by 8000 other employees, are engaged in programs of the AEC, backed up by an 8-year record of operating AEC's plutonium facilities at Hanford where provisions are being made to recover waste heat productively. Thus early answers on atomic power problems can be expected.

Today's wide range of atomic activities at General Electric including submarine and aircraft nuclear propulsion, materials development, atomic instrument design and production, and the Atomic Power Study are helping to speed the harnessing of this dynamic source of energy for peace. For more data from G.E.'s Atomic Power Study, write Apparatus Sales Div., Section 301-247, Schenectady 5, N. Y.

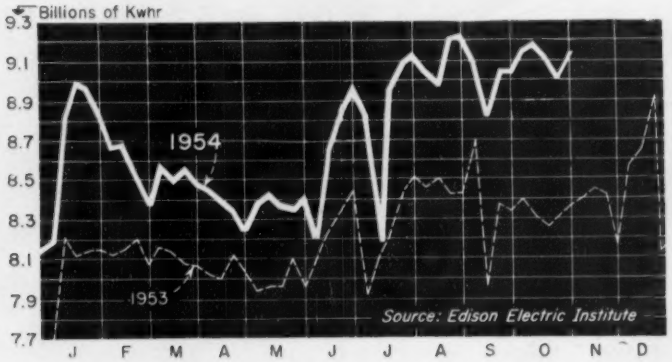
*MORE POWER TO AMERICA*

**GENERAL ELECTRIC**

# Electrical World

Vol 142 No 19 November 8, 1954

Published for 80 years for those engaged in the business of generating, transmitting, distributing, or applying electric power


## Output Week Ended Oct 30—9,152,000,000 Kwhr

Per Cent Change from Previous Year

| | Total US | New Eng. | Mid. Atlan. | Cent. Ind. | West Cent. | South-east | South Cent. | Rocky Mount. | Pacific NW | Pacific SW |
|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 30 | +9.4 | +0.9 | +3.2 | +3.9 | +5.6 | +20.4 | +14.3 | +4.3 | +8.2 | +8.9 |
| Oct. 23 | +8.8 | −0.4 | +2.8 | +4.5 | +4.6 | +22.2 | +5.0 | +0.9 | +5.9 | +8.2 |
| Oct. 16 | +10.3 | +2.3 | +5.7 | +3.6 | +7.0 | +22.7 | +16.9 | −2.6 | +7.6 | +7.8 |

Seasonally Adjusted Index †173.5 Week Ago 172.5 Year Ago 158.7

## Electric Power Statistics

| | | Latest Month | Preceding Month | Year Ago |
|---|---|---|---|---|
| Peak Load ‡(Million Kw) | Aug. | 79.7 | 78.2 | 74.3 |
| Capacity (Million Kw) | Sept. | 99.16 | 98.08 | 87.59 |
| Production (Billion Kwhr) | Aug. | 41.17 | 40.08 | 38.53 |
| Hydro | Aug. | 8.34 | 8.76 | 8.45 |
| Fuel | Aug. | 32.82 | 31.32 | 30.08 |
| Fuel Consumption: | | | | |
| Coal (Million Tons) | Aug. | 9.83 | 9.40 | 9.71 |
| Oil (Million Barrels) | Aug. | 4.85 | 4.45 | 6.54 |
| Gas (Billion Cu Ft) | Aug. | 130.49 | 127.37 | 112.88 |
| Sales (Billion Kwhr) | Aug. | 33.88 | 32.99 | 32.82 |
| Residential | Aug. | 9.65 | 9.50 | 8.48 |
| Commercial | Aug. | 6.66 | 6.52 | 5.98 |
| Industrial | Aug. | 14.90 | 14.35 | 15.83 |
| Other | Aug. | 2.68 | 2.62 | 2.52 |
| Net Income Class A & B Companies ($ Million) | Aug. | 89.43 | 84.44 | 77.24 |
| Estimated Dec. '54 Peak ‡(Million Kw) | July | 88.1 | 88.1 | 91.9 |
| Kwhr per Residential Customer (12 Month Average) | July | 2,458 | 2,441 | 2,272 |
| Revenue per Kwhr Residential Service (12 Month Average) | July | 2.71¢ | 2.71¢ | 2.75¢ |
| Canadian Production (Billion Kwhr) | Aug. | 5.46 | 5.48 | 5.09 |

## Business Statistics

| | | | | |
|---|---|---|---|---|
| FRB Industrial Production Index† | Sept | 126 | 124 | 135 |
| Gross National Product Annual Rate ($ Billion) | 2nd Qtr. | 356.0 | 355.8 | 369.9 |
| EW 4 Industry Production Index† | Sept. | 117.0 | 115.4 | 124.9 |
| ENR Construction Cost Index† | Oct. | 134.6 | 134.3 | 128.0 |
| BLS Consumer's Price Index | Sept. | 114.7 | 115.0 | 115.2 |
| NEMA Insulation Materials Sales Index† | Aug. | 111 | 92 | 153 |
| NEMA Electric Appliance Sales Index† | Aug. | 91 | 88 | 90 |
| NEMA Household Refrig. Sales Index† | Aug. | 71 | 93 | 63 |

*Preliminary **Revised ‡Class 1 System †1947-49=100 ††1949=100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ELECTRICAL WORLD

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# THE ELECTRICAL WEEK

**The Issue's News Highlights . . .** McGraw-Hill Department of Economics survey indicates that industry's preliminary plans for capital spending in 1955 will be 5% lower than for this year.

President Eisenhower endorsed Dixon-Yates contract at a press conference while former TVA Chairman Gordon Clapp attacked it before Langer subcommittee. Hearings before Joint Congressional Atomic Energy Committee are now under way.

Severe snow storm cuts service in CEI area.

**Sen Spessard L. Holland** (D-Fla.) recently warned that REA and rural telephone programs would "retain maximum support of general public only as long as they continue to recognize need for retention and encouragement of private enterprise wherever it measures up to reasonable standards of public service." He added "I have never considered REA as a replacement of private industry but only as an agency through which the blessings of electricity can be brought to farm homes which private utilities have not been able to service."

**Consumers Power** temporarily shelves consideration of separating its gas and electric businesses, according to Chairman Justin R. Whiting.

**San Diego G&E** notifies City Council it will ask for $5.5 million a year electric rate increase to bring its return up to 5.9% from 4.01% it expects to show for 1955.

**No new steam plants** are contemplated in TVA budget for next fiscal year, reports TVA Chairman Brig Gen Herbert D. Vogel. He also notes that TVA and AEC are "together in theory" on proposal that Dixon-Yates project supply power to TVA.

**Regional survey** by National Association of Manufacturers places 1950-60 capital expenditures of investor-owned electric and gas utilities in California, Montana, Oregon, Washington, and Idaho at $3.9 billion. California stands out with a grand total of $2.9 billion.

**Arkansas P&L** is appealing to circuit court PSC's refusal of company's $3.9 million a year rate increase application; will go higher if necessary.

**Niagara Mohawk Power** connects millionth customer, becoming ninth U. S. system to reach million mark.

**Pacific G&E** will emphasize electric space heating in 1955 appliances sales promotion starting January . . . On Nov. 22 California PUC will hear Pacific G&E's application to build $8.5 million, 50,000-kw steam plant at Buhne Point near Eureka. Bechtel Corp will design and build plant.

**Off the Washington Wire . . .** REA and National Rural Electric Cooperative Association both plan to ask Congress to change or abolish the loan formula in the REA act. REA Administrator Ancher Nelsen is not yet sure whether he wants the formula abolished completely, but he does want a general flexibility to take care of the growing G&T loan needs, which are large in some areas. NRECA wants formula killed outright.

Just a few days before Nov. 4 hearing before Joint Atomic Energy Committee hearing on Dixon-Yates contract, G. O. Wessenauer, TVA manager of power, was quoted as saying the Administration has never corrected a $200,000 error in its estimate of the cost of Dixon-Yates power. He said AEC and Budget Bureau figures showed the government would pay $3,685,000 a year more for Dixon-Yates power than for TVA power, and that if the error were corrected, this would go to $3,885,000.

**Puget Sound Utilities Council** expects quick agreement with BPA on scheme whereby Council would be reimbursed in power for financing and building $250-million Mica Creek dam on Columbia River near Revelstroke, B. C. Council's consulting engineer, Jack Stevens, says no difficulties are in sight. Next step: Meeting with British Columbia officials to iron out Canadian part in project which is aimed at adding 1.2 million kw of prime power to U. S. systems plus 900,000 kw for Canadians at site.

**Boston Edison** believes hurricane damage costs will not reduce net earnings below current $2.80 a share annual dividend rate.

**Cutting costs of nuclear reactors** can be done, technically, but it will take actual experience in building and operating them to solve problems of extracting heat and controlling rate of fission, according to R. A. Bowman, Bechtel Corp.

**FPC** calls for more information on which to determine whether difference in rates charged by South Carolina Generating for sales to Georgia Power and South Carolina E&G is justified.

**Executive Changes . . .** Sydney L. Hall, who resigned in 1952 from Cleveland Electric Illuminating as vice president and secretary, was made a vice president of Potomac Electric Power Co, effective Dec. 1 . . . Consumers Power elected Harry R. Wall vice president in charge of electric production and transmission.

## Regular News Services


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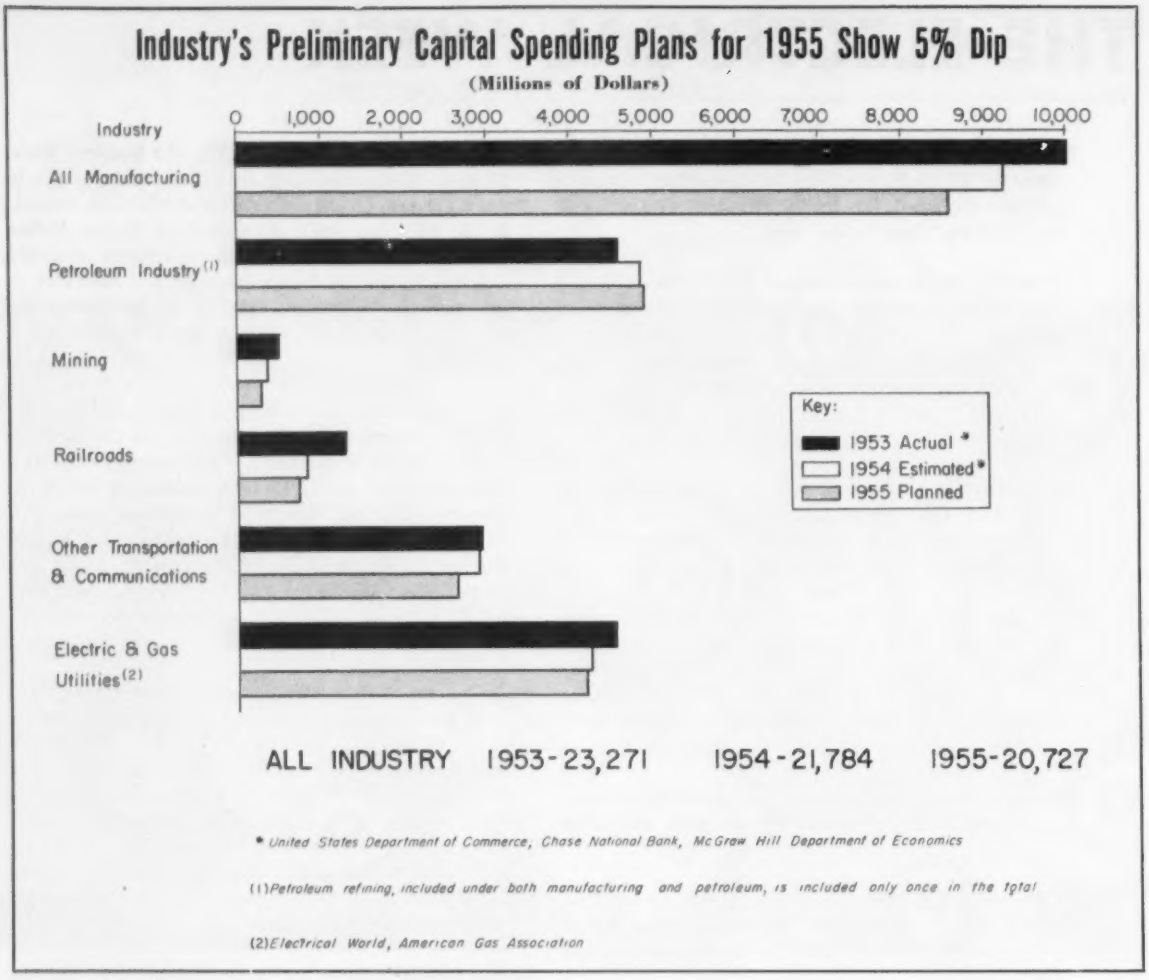



# Industry Plans Less Spending in 1955

American industry's preliminary plans for capital spending for 1955 are about 5% less than for this year, according to a survey of business plans for new plants and equipment just completed by McGraw-Hill Department of Economics.

Results of the survey showed that industry now plans to spend $20.7 billion next year, compared to an estimated expenditure of $21.8 billion in 1954 (see chart above).

Manufacturing firms plan to cut their capital spending for new plants and equipment next year to $8.6 billion, about 7% less than in '54. Mining, electric and gas utility, railroad and other transportation and communications also expected to reduce their capital spending in 1955. Petroleum firms, however, are now planning to increase capital spending slightly in '55.

Results of the McGraw-Hill survey indicate that capital spending by manufacturing companies may level off in 1955. This would end a decline that began in the latter part of 1953.

When it comes to selling, industry has an overwhelmingly optimistic outlook for 1955. Survey results show that a strong majority of companies in almost all segments of industry expect an increase in sales next year. (Detailed analysis of the sales picture appears on page 66.)

The McGraw-Hill report stressed that the figures on industry spending plans are preliminary because many companies do not complete their budget reviews until later in the year. Past experience, however, has shown these advance estimates to be accurate indicators of the trends in capital spending by business.

Companies in most of the major manufacturing industries report that their capital investment will be somewhat lower in 1955. Only two of the major categories of manufacturing indicated their capital outlays would rise next year. These are primary metals, up 1%, and miscellaneous manufacturing, up 5%. In this latter group are lumber, apparel, furniture, and other industries not covered by the major manufacturing classifications.

For the most part, declines expected in major manufacturing groups are small: Textile companies plan to cut capital spending by 1%; chemical processing firms by 2%, food and beverages by 10%.

The decline estimated for the metalworking industry is larger—17%. Within this group the "other metalworking classification" (instruments, fabricated metal products and ordnance) expects a 9% increase while the auto industry plans a decrease of 40%. One reason for large dip in spending by auto industry, the survey points out, is the fact that in 1954 large expenditures were made for new tools and body dies in connection with model changes. Such expenses are not planned for '55.

Survey results indicate that the post-Korea boom in defense industries no longer has a major effect on their capital spending. Most of the manufacturing industries that expanded rapidly during 1951-53 to meet defense needs—steel, nonferrous metals, machinery, electric machinery, chemicals, petroleum refining, transportation equipment—cut back their capital spending fairly sharply in 1954. In 1955, with a few exceptions, most of them plan to cut spending by less than the average for other nondefense industries. In general capital outlays by defense industries show a tendency toward levelling off after dropping from peak levels of defense expansion.

Only major non-manufacturing industry fully covered by the McGraw-Hill study that anticipates a higher level of capital spending in 1955 is petroleum. Overall increase for spending in '55 over this year is 1%. But capital spending for crude oil production is expected to go up 7% whereas outlays for refining and transportation of petroleum and petroleum products are expected to decline.

Cutback in capital spending in mining is planned at 18%, mainly in coal mining. Capital spending for iron mining, excluding taconite, is expected to dip 13%. The survey reports that firms are putting more of their investment funds into taconite and iron ore developments outside the U. S.

In nonferrous mining present plans call for a capital spending increase of 17% next year. This comes after a sharp drop in spending in 1954.

Railroads, which also cut capital spending sharply in 1954, plan a 10% reduction in 1955. Other transportation and communications industries—shipping, trucking, airlines, telephones—also expect a 10% cut.

Electric and gas utilities plan reduction of only 2% in expenditures for new plants and equipment in '55.

This year the McGraw-Hill survey took a limited

## Manufacturing Firms' Capital Spending Plans for 1955

(Millions of Dollars)

| Industry | 1953 Actual* | 1954 Estimated* | 1955 Planned | Per Cent Change 1954–1955 |
|---|---|---|---|---|
| Primary Metals | $1,634 | $1,134 | $1,145 | + 1% |
| Iron and Steel | 1,189 | 830 | 805 | − 3 |
| Nonferrous Metals | 445 | 304 | 340 | +12 |
| Metalworking | 2,942 | 3,235 | 2,683 | −17 |
| Machinery | 803 | 694 | 688 | − 1 |
| Electrical Machinery | 481 | 461 | 431 | − 6 |
| Autos | 1,000 | 1,350 | 811 | −40 |
| Transportation Equipment (including aircraft) | 168 | 160 | 132 | −17 |
| Other Metalworking | 490 | 570 | 621 | + 9 |
| Chemical Processing | 3,162 | 3,011 | 2,943 | − 2 |
| Chemicals | 1,559 | 1,328 | 1,269 | − 4 |
| Paper | 431 | 448 | 423 | − 6 |
| Rubber | 158 | 133 | 121 | − 9 |
| Stone, Clay and Glass | 339 | 335 | 413 | +23 |
| Petroleum Refining | 675 | 767 | 717 | − 7 |
| Food and Beverages | 818 | 764 | 686 | −10 |
| Food | 525 | 499 | 548 | +10 |
| Beverages | 293 | 265 | 138 | −48 |
| Textiles | 351 | 290 | 288 | − 1 |
| Miscellaneous Manufacturing | 1,119 | 815 | 853 | + 5 |
| ALL MANUFACTURING | 10,026 | 9,249 | 8,598 | − 7 |

* United States Department of Commerce; Chase National Bank; McGraw-Hill Department of Economics.

## Preliminary Investment Plans for 1956

| | Per Cent of Companies Answering | | |
|---|---|---|---|
| | Up[1] | Down[1] | About Same[1] |
| Primary Metals | 19% | 35% | 46% |
| Steel | 8 | 17 | 75 |
| Nonferrous | 29 | 50 | 21 |
| Metalworking | 19 | 17 | 64 |
| Machinery | 23 | 11 | 66 |
| Electrical Machinery | 13 | 21 | 66 |
| Autos | 0 | 25 | 75 |
| Transportation Equipment (including aircraft) | 15 | 15 | 70 |
| Other Metalworking | 21 | 33 | 46 |
| Chemical Processing | 29 | 25 | 46 |
| Chemicals | 37 | 20 | 43 |
| Paper | 48 | 24 | 28 |
| Rubber | 9 | 55 | 36 |
| Stone, Clay, and Glass | 9 | 22 | 69 |
| Food | 23 | 21 | 56 |
| Textiles | 9 | 17 | 74 |
| Miscellaneous Manufacturing | 14 | 26 | 60 |
| ALL MANUFACTURING | 21 | 22 | 57 |
| Petroleum Industry | 27 | 27 | 46 |
| Mining | 16 | 25 | 59 |
| Railroads | 13 | 48 | 39 |
| Other Transportation and Communications | 43 | 57 | 0 |
| ALL INDUSTRY | 21 | 24 | 55 |

[1] Compared with 1955.

sampling of capital spending plans of major chain and department stores. The result indicates that these commercial establishments plan a substantial increase in spending in 1955 over 1954. Since the sample was small, the figure was not included in the overall statistics presented in the report. However, McGraw-Hill Department of Economics cited this planned increase in spending as a favorable element in the economic picture.

**Leveling Off Seen in '55 . . .** Capital spending by manufacturing firms may level off in 1955, ending the decline that started late in 1953, according to the survey. Most manufacturing companies—57%—presently expect they will spend about as much for new plants and equipment in 1956 as in '55. About 21% of the companies expect to increase capital spending in '56 and the remaining 22% expect to cut it.

Spending plans for 1956, the report points out, are highly tentative. The tendency, however, is for companies to underestimate capital spending for more than one year ahead. Thus the study notes "the response to this survey is distinctly favorable to the prospect of capital spending by manufacturers at a level at least as high in 1956 as in 1955."

In the nonmanufacturing industries about 55% of the companies expect to spend about as much in 1956 as in 1955 while 21% expect to increase capital spending and 24% to cut it.

**Reclassifications . . .** This year the McGraw-Hill Department of Economics reclassified expenditures in order to (1) group similar industries together, (2) produce a mining figure which does not include oil well drilling but does include most mining expenditures by manufacturing firms, and (3) produce a petroleum figure that covers the entire petroleum industry.

Because of these reclassifications, the dollar estimates reported in the survey are in most cases not comparable with Department of Commerce capital spending statistics, nor with dollar totals in previous McGraw-Hill surveys.

The McGraw-Hill survey is based on industry's replies to questionnaires which were mailed out at the end of September and the beginning of October.

E. H. DIXON (second from right) is shown inspecting Mississippi River site at West Memphis, Ark., where proposed generating plant would be built under Dixon-Yates power contract. With Dixon on tour are (left to right): Roane Waring, president, Memphis Chamber of Commerce; West Memphis Mayor H. B. Price; and C. R. Bowers, engineer for West Memphis industrial council. Hearings on Dixon-Yates contract began last week before Joint Committee on Atomic Energy.

# Dixon-Yates Debate Continues

## Eisenhower endorses contract at press conference while Clapp testifies against it at Langer subcommittee hearing

With the easing of election pressures, discussions on the details of the Dixon-Yates power contract can be expected to be carried on in a less frenzied atmosphere, lacking the color of the political campaigns, but disclosing to the public more accurate information.

In the last few days before the election, both sides in the controversy brought up their big guns, with opponents of the contract getting bigger press play, chiefly because they said more.

There was a reason for this. The Eisenhower Administration, which has steadfastly refused to release the contents of the controversial document pending a meeting Nov. 4 before the Joint Atomic Energy Committee, was convinced the contract had not developed into the hot political issue the Democrats had tried to make it. Therefore, although growing pressure to release the contract's details had almost succeeded in getting AEC to publish it in recent weeks, White House strategists decided it would be better to keep the proposal under wraps until later, rather than take a chance of arming Democrats with more ammunition at the last minute.

President Eisenhower strongly endorsed the proposal and one of those most instrumental in bringing it to fruition—Chairman Lewis Strauss of the AEC. at a White House press conference, the chief executive said (1) the government is perfectly protected in the contract, and (2) he could think of no one in government in whose integrity, common sense and business acumen he had more trust in than Strauss'. He pointed out that all federal agencies concerned with the contract had expressed approval of the arrangement, and Congress would have final say in the matter.

On the opposition side, Sen William Langer (R-N. D.) continued to use his anti-monopoly subcommittee as a sounding board for attacks on the agreement. He brought former Tennessee Valley Authority Chairman Gordon Clapp in for two days of testimony. In these sessions, Clapp said:

• The Dixon-Yates proposal is the opening step in a program deliberately planned to destroy TVA. Clapp said the combination of the two Dixon-Yates companies—Middle South Utilities and Southern Co—and two federal agencies—the Budget Bureau and AEC—was trying to "squeeze TVA into submission to public utilities so that in future years they can dictate to municipalities and rural electric cooperatives."

• The proposed Dixon-Yates plant was "an unsound engineering scheme." He said it would be placed "on the quicksand" of the Mississippi valley.

At the Langer hearings, correspondence read into the record also disclosed AEC's vote on the final proposal on Oct. 5. At that time, Strauss and Commissioner Joseph Campbell, both Eisenhower appointees, voted in favor of the contract. Truman-appointed Commissioner Thomas Murray abstained, and Dr Willard F. Libby, also declined to vote because he had just taken oath of office. Fifth post, now filled by Dr John von Neumann, was then vacant.

**St Lawrence Dispute . . .** Other developments last week included:

• Langer and Sen Estes Kefauver (D-Tenn), another TVA-area opponent of the contract, said they would ask the Senate next year for $1 million to finance a sweeping anti-monopoly investigation covering other utility matters, as well as Dixon-Yates. They declared they would scrutinize thoroughly the entire St Lawrence and Niagara projects.

• Franklin D. Roosevelt, Jr, Democratic candidate for attorney general in New York State, clashed with New York State Power Authority Chairman Robert Moses over St. Lawrence power disposition. Roosevelt declared the legislation authorizing the state authority to do the U. S. half of the job was initiated by Sen Irving Ives, New York Republican gubernatorial candidate, whose former administrative assistant was Dwyer Shugue. Roosevelt claimed Shugue was well known lobbyist of the Niagara Mohawk Power Corp, and that Ives owned Niagara Mohawk stock. He charged a tie-up between retiring Gov Thomas Dewey, Ives, and Niagara Mohawk.

Moses declared Roosevelt's charges were based on "trashy, false and irresponsible stories" and he made them "obviously as a political gesture."

# Snow Storm Cuts CEI Service

**Power to about 7,000 homes served by the Cleveland utility interrupted by six to eleven-inch snowfall**

Six to eleven inches of heavy wet snow dropping on full leafed trees caused interruption of electrical power to approximately 7,000 homes served by Cleveland Electric Illuminating Co Oct. 30 to Nov. 1. Sagging or fallen tree limbs were blamed for the disruption of service and system damage. First outage was reported to the company Saturday night, Oct. 30, at 8 pm after snow started to fall about four hours earlier. By 10 pm the number of phone calls to CEI had become an avalanche.

By storm's end Sunday, Oct. 31 about noon, CEI found itself with more than 1,000 wires down including 800 service loops. Eight distribution feeders had gone out and between 200 and 300 primary sections. Repair crews cut away the damaged primary sections and strung new wire.

CEI resumed complete service by Monday evening, Nov. 1.

Acknowledging the immensity of the job facing it, CEI officials accepted the proffered service of five repair crews from Ohio Power Co, five from Toledo Edison Co and 10 crews from Ohio Edison Co. These twenty fully manned crews from these three companies joined the 80 CEI crews Nov. 1. Twenty CEI crews were taken off for rest on that day after being on duty since Oct. 29.

Damage is estimated at more than $250,000, far in excess of the damage caused by the June, 1953, tornado.

# Democrats Control House Chairmanships

Democratic victory in the House last week brought a more liberal political lineup to the lower chamber committee chairmanships concerned with power and public resource development.

Democrats who are rated as more liberal than their Republican predecessors are scheduled to head the following committees: Appropriations, interior, judiciary, public works, and possibly atomic energy.

Here are the prospective chairmen:

Appropriations—Rep Clarence Cannon of Missouri, would be apt to be more generous to federal power and public works projects than Rep John Taber of New York.

Interior—Rep Clair Engle of California has never chairmanned committee. Acknowledged as one of the best informed members, Engle is no flaming liberal, but is sure to favor a stronger federal participation in power and reclamation development than outgoing chairman, Rep. A. L. Miller of Nebraska.

Public Works—Rep Charles Buckley of New York is credited with being more liberal than his predecessor, Rep George Dondero of Michigan, and would tend to go down the line with Democratic position in favor of a strong federal public works program.

Judiciary—Rep Emanuel Celler of New York will give committee a considerably more liberal complexion than under outgoing chairman, Rep Chauncey W. Reed of Illinois. However, Celler's interest is likely to center on anti-monopoly legislation.

As Electrical World went to press control of Senate was in doubt.

Listed below are present GOP chairmen and probable Democratic committee heads should Democrats win:

Appropriations, Styles Bridges (R-N. H.), Carl Hayden (D-Ariz.); Interior, Guy Cordon (R-Ore.), Clinton Anderson (D-N. M.); Public Works, Edward Martin (R-N. D.), Dennis Chavez (D-N. M.); Judiciary, William Langer (R-N. D.), Harvey Kilgore (D-W. V.).

Joint Atomic Energy Committee poses biggest puzzle. Chairmanship usually rotates from House to Senate and by precedent it should go to Senate next year. But House members have been much more active on the committee. If Democrats control both houses it is likely Rep Carl Durham (D-N. C.) will head joint group. If Republicans take the Senate they will undoubtedly insist Sen Bourke Hickenlooper (R-Iowa) take charge.

# IN THE INDUSTRY

Five Pacific Northwest electric companies are contemplating a real Paul Bunyon leap into the atomic power field. If they decide to go through with the proposition now under study, the area stands to gain a substantial addition to present electrical generating capacity.

**Pacific Northwest Utilities Study Big Nuclear Plant**

Atomic Energy Commission sources indicate a decision could come before the end of the year but point out that the proposition is of such tremendous proportions that it may take much longer. The proposed plant is a possible entry in the AEC Reactor Division's "reactor of the year" scheme for speeding development of atomic power.

**A GE Proposal . . .** The proposition now being studied stems from a proposal made in October of last year by General Electric Co (EW, Oct. 26, 1953, p8). At that time the large equipment manufacturer offered to build for the government a power-plutonium reactor at AEC's Hanford, Wash., installation. When this offer met a cool reception from AEC, GE revamped the proposal to appeal to privately owned electric companies in the area.

A study team consisting of Montana Power Co, Washington Water Power Co, Pacific Power & Light Co, Portland General Electric Co, and Mountain States Power Co was formed in May of this year mainly to consider the GE proposition. Engineering representatives of the five companies were surprised at the planning and scope of the project which GE put before them. None of them had expected more than a broad study proposal. Instead they were shown preliminary designs of a huge dual-purpose nuclear plant as well as economic studies indicating the feasibility of the project.

While no public announcements have been made as to the details of the GE proposal, informed outsiders put together these guesses: The plant will incorporate much of the reactor technology now used in the Hanford reactors for producing plutonium. GE operates the Hanford installation under AEC contract. Reactor portion of the proposed power plant would likely be a graphite-moderated, water-cooled pile capable of generating 400,000 kw or more of electricity.

Steam generated by the reactor heat would be fed to a number of turbo-generator units in a conventional manner. Some outside engineers believe that units 100,000 kw or smaller may be used instead of larger ones. Because of the peculiarities of the reactor, units will be at comparatively lower temperatures and pressures than would be necessary for conventional type equipment.

**Partnership Approach . . .** Because the plant would produce relatively large amounts of weapon-grade plutonium and because of possible hazard risks, the federal government is almost certain to play a leading role in the proposed development. It is a good guess that AEC will want to retain full control of the reactor portion of the plant, leaving the more conventional turbo-generator portion to privately owned utilities. GE would develop and design the plant for the utility group.

Representatives of the five companies studying the proposition have been in constant touch with GE since the investigation began in May. In addition they have toured most other AEC installations where nuclear power studies are in progress.

Considerable encouragement for the proposition has come from AEC officials. AEC Chairman Lewis L. Strauss, himself, has indicated interest in the dual-purpose approach to nuclear power generation. AEC General Manager Kenneth D. Nichols also is known to be favorable to this approach.

Both see it as a possible short cut to the economic production of electric power from nuclear fuel. As the production of plutonium would bear a sizeable share of the overall plant costs, the power generated might well be in a cost range to interest utilities in the area.

# TECHNICAL NOTES

ARCHER E. KNOWLTON

**Tremendous savings can be achieved** if construction of new circuits can be deferred for several years or existing circuits made to handle doubled loading with adequate regulation.

**Geiger counter records** will be useful in case an employee charges excessive exposure to radiation in the vicinity of nuclear reactor experimentation.

**Poor fuels and extended overloads** would probably favor use of steam for boiler tube cleaning.

**Cable partially submerged** in wet, low resistivity mud in a duct is likely to incur corrosion at the mud line where a differential-aeration cell exists.

**Cathodic protection** can be a source of utility revenue as well as expense. Mothball fleet vessels' hulls are being protected by rectified 24-v dc power supplied by the local utility.

**Wind at less than 90 degrees** to a line seems to be more conducive to the initiation of conductor galloping. Velocities between 10 and 45 mph are the usual limits.

**Shielding effect of the metal enclosure** of an isolated phase bus reduces the electromagnetic force on the conductor due to short circuit currents to some 20% of its nominal value without an enclosure.

**Plutonium stocks** when no longer needed for defense will be one of the most useful of the war surpluses ever released by government.

**Over-excitation of generator field** can, of course, result in overheating of the windings. Hot spots at shorted turns or grounds will also result in overheating of field windings.

**Wave guide in "magic tee" form** can be used to reveal eccentricities of a commutator or slip ring in an irregular trace on an oscilloscope.

**Operating manpower varies considerably** even among stations of similar characteristics. Why should it?

# LOOK!...

## another great technological advance

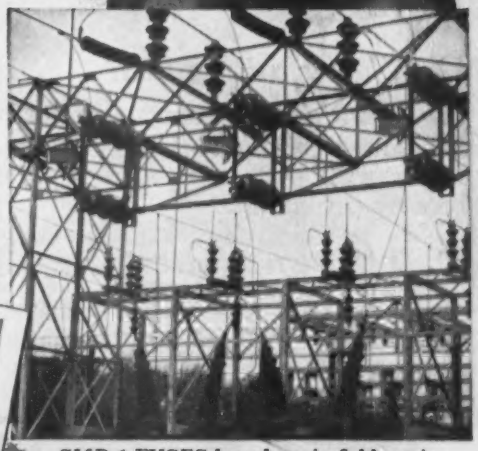
**THE NEW SMD-1**
# POWER FUSE
developed to protect your system with the highest reliability, at the lowest cost

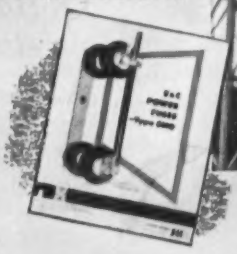
**S&C's new Type SMD-1—a 500,000 kva* fuse embodying the engineering achievements of the well-known SMD-2—marks another milestone in the fuse art. It has technological innovations which enable it to fill a void in the economics of power system protection.**

** Three-phase symmetrical*

**DESIGNED FOR APPLICATION** on primaries of power transformers tapped directly on transmission and subtransmission lines, Type SMD-1 Power Fuse provides dependable interruption of both high and low fault currents—regardless of type of system or type of fault. Time-current characteristics are accurate and permanent—unaffected by corrosion, aging, vibration, or surges. Transient-recovery voltages are no problem during circuit interruption, since fuse flashover withstandability equals the protected insulation level of the system.

Complete information on how the SMD-1 Fuse will fit profitably into your power system is contained in this new Catalog Section 261 . . . we will gladly send you a copy.





*SMD-1 FUSES have been in field service since March, 1952. The fuses have had many occasions to clear faults, and have done so successfully in each case.*

**S&C ELECTRIC COMPANY**

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CHICAGO 40, ILLINOIS, U. S. A.

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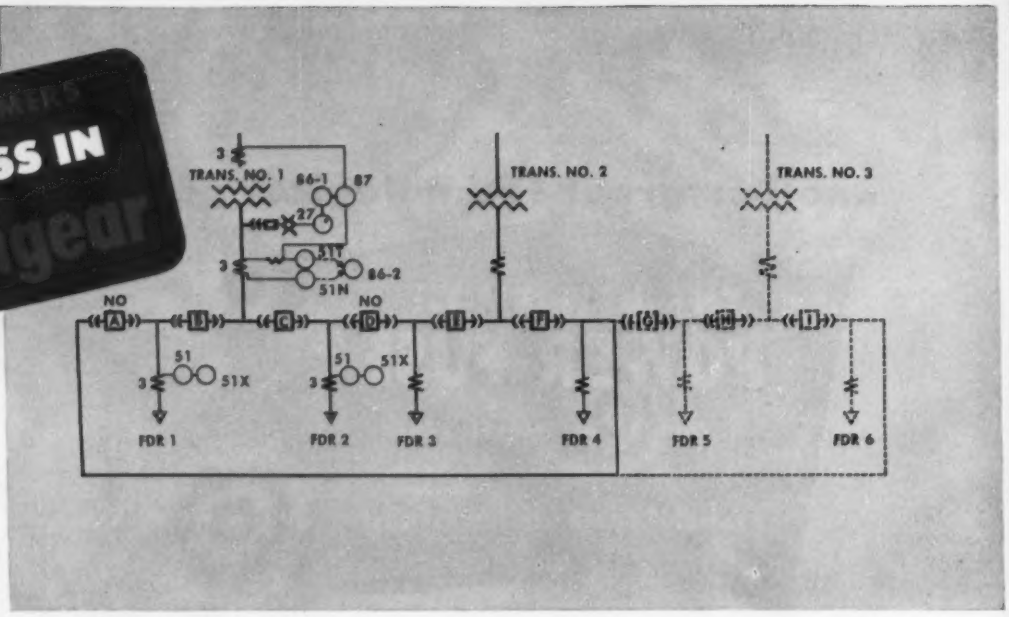
POWER FUSES • DISTRIBUTION CUTOUTS AND FUSE LINKS • LOAD INTERRUPTERS • METALCLAD SWITCHGEAR

*Specialists in High-Voltage Circuit Interruption*

ALLIS-CHALMERS

PROGRESS IN Switchgear




# RING BUS...

## Here are Questions and Answers on why

*Q. What is a Ring Bus?*

A. It is a circuit arrangement for improving power continuity by providing every feeder with two sources, using only one breaker per circuit.

*Q. Is this a new idea?*

A. No. It is among the first schemes studied by substation engineers, but in its early conception it had certain drawbacks.

*Q. What were the problems of early Ring Bus schemes?*

A. Problems were mainly in physical arrangement, large space requirements, and need for tie cables and connecting bus runs.

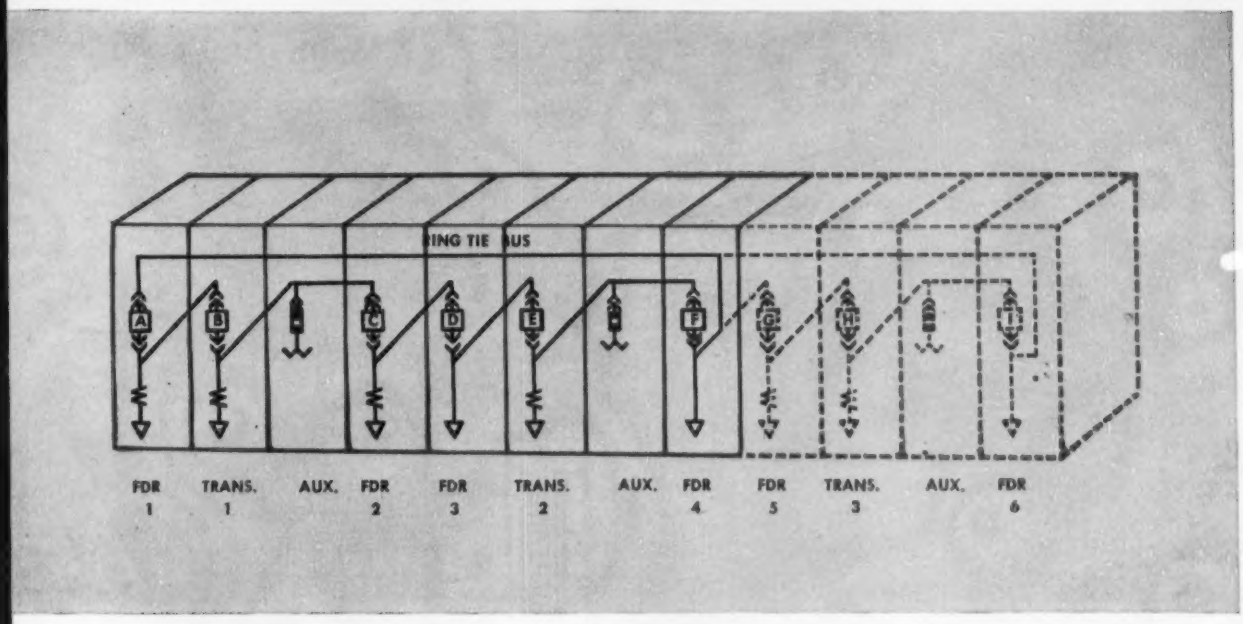
*Q. Have these problems been eliminated?*

A. Yes, Allis-Chalmers pioneered a metal-clad switchgear design that permits the entire ring to be included in a lineup of standard metal-clad switchgear cubicles, thus conserving space and eliminating tie cables and connecting bus runs.

*Get More Information*

Ask for the brief but interesting engineering paper, "Continuity of Service at Distribution Voltages by Means of Ring Bus." Call your nearby Allis-Chalmers office, or write Allis-Chalmers, Milwaukee 1, Wisconsin.

ALLIS-




# Advantages

## interest is turning again to the Ring Bus

Q. *What are main advantages of Ring Bus?*

A. There are several in addition to those mentioned.

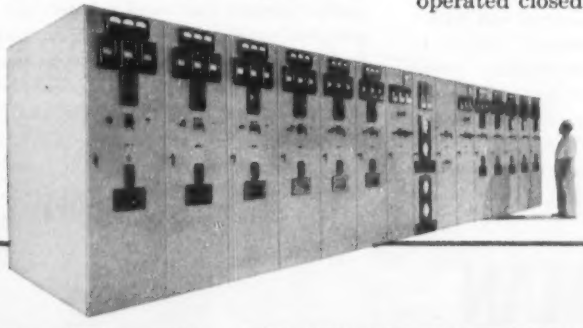
1. **Adds power continuity** — Any breaker can be removed from its unit without disrupting continuity of service.

2. **Aids maintenance** — Any portion of switchgear bus can be de-energized by dropping only one circuit.

3. **Adds flexibility to station** — Substation capacity may be increased by adding transformer and feeders at either end by dropping only one circuit.

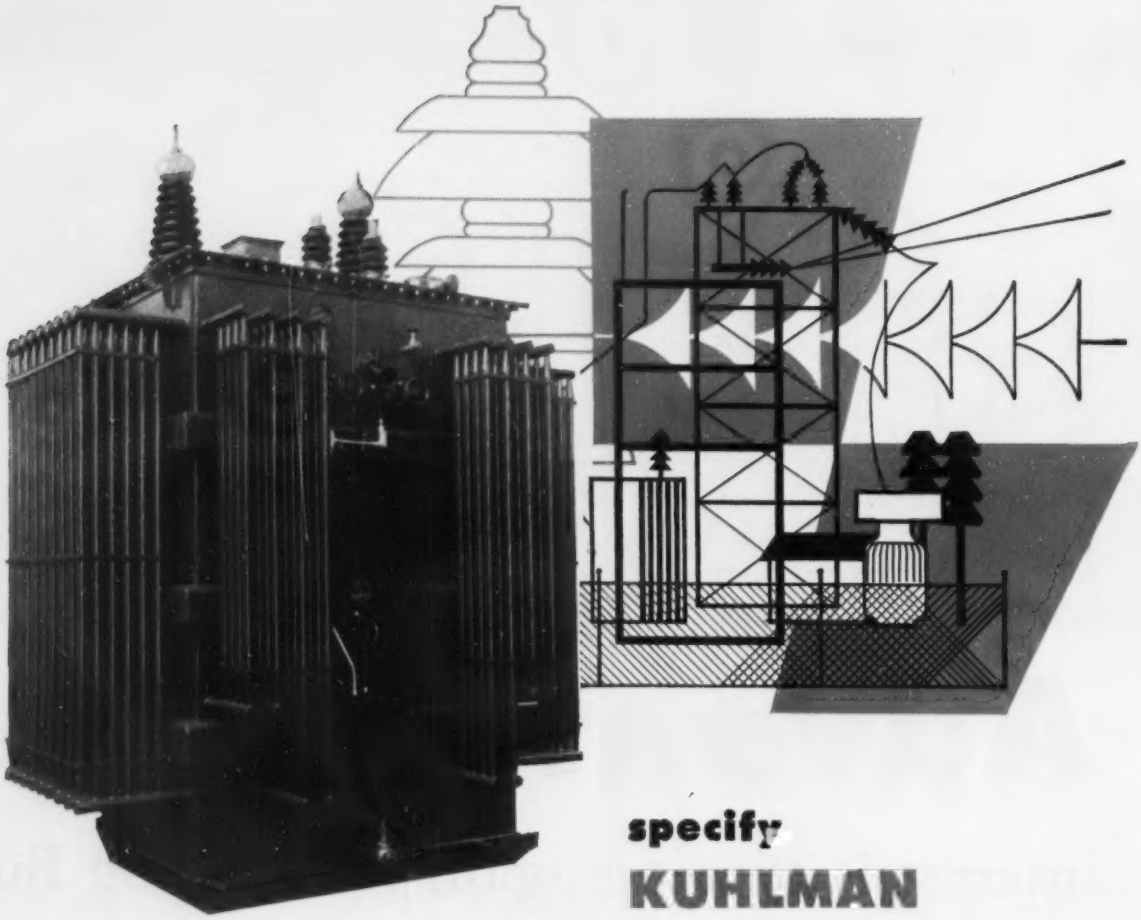
4. **Ring Bus is versatile** — Each set of feeders and its supply transformer can be operated separately when ring tie breakers are open. When momentary interruptions are undesirable, ring may be operated closed and transformers paralleled.

A-4421



# CHALMERS

A-C ALLIS-CHALMERS



# specify KUHLMAN for dependable power transformers

For more than half a century, Kuhlman Power Transformers have been providing a steady and dependable source of power for American utilities and industry. Built from finest quality materials and engineered for safe, economical operation, these units incorporate the latest design principles, many of which were developed by Kuhlman. Coils are dried under heat in vacuum to insure uniformly high insulation strength and then impregnated with thermosetting varnish to provide good mechanical strength. Insulation is coordinated to the basic impulse level. Windings are equipped with wide oil ducts for insulation and ample cooling. Oil is introduced under vacuum to prevent entrapment of air and insure high insulation strength. Construction throughout is sturdy and rigid. Structural steel core clamps hold the core securely in place to prevent shifting or vibration and provide support for coil braces, lead guides and terminal structures. Tanks are constructed of heavy steel plate, and sealed to minimize deterioration of oil.

Kuhlman Power Transformers are assembled by men who are highly skilled in the electrical crafts. They are thoroughly inspected and tested to meet rigid quality standards. Kuhlman Power Transformers can be produced in a wide variety of ratings, with accessories to suit the specific needs of utilities and industries. For complete information, write for Bulletin CS-601. Kuhlman also builds Distribution, Dry Type, Saf-T-Kuhl, Subway, CSP and Series Street Lighting Transformers. Bulletins are available on these models as well.

151-T

# KUHLMAN

KUHLMAN ELECTRIC COMPANY, BAY CITY, MICHIGAN • Southern Division, CRYSTAL SPRINGS, MISSISSIPPI

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SIXTY YEARS OF PROGRESS IN THE ELECTRICAL INDUSTRY

It's a crazy life . . .

READING MAIL is job Mrs Kessler tackles first

DICTATING replies is the next order of business

EXPLAINING assignment is part of day's routine

CALL FROM GOVERNOR is not an unusual occurrence since Mrs Kessler, as PUC president, is a member of cabinet. She is only woman cabinet member in N. J.

for a grandmother, but

# Mrs Kessler Loves It

She doesn't have time to take her hat off in the office, nor does she take time to go out of the building for lunch. New Jersey's Public Utilities Commission president is so busy, in fact, that in trying to fit another appointment into her crowded schedule, she's been heard to exclaim: "What a crazy life for a grandmother!" But there is no doubt about it, Mrs Hortense Fuld Kessler thrives on her "crazy" life and wouldn't have it any different.

New Jersey's lady PUC president maintains an office in Newark, but travels frequently to Trenton where the commission also has an office. In addition to conducting hearings in various cities on regulatory matters, Mrs Kessler has

MRS KESSLER often refers to her law books in office in course of a day

EATING LUNCH at desk is daily practice for the busy PUC head

CONFERENCES with aides occupies much of Mrs Kessler's time. Here she consults L. P. Hartshorn on accounting matter

## It was strange at first, says

many callers to see each day and must consult with the commission's other two members and with staff members.

The commission has three members but each sits separately to hear a case except in very rare instances. Each commissioner's findings are reviewed by the full commission and then a decision is reached.

Though Mrs Kessler's office day is over at 5 pm, her working hours don't end there. In the evening she attends meetings of industry organizations and she finds herself thinking about commission business almost all the time.

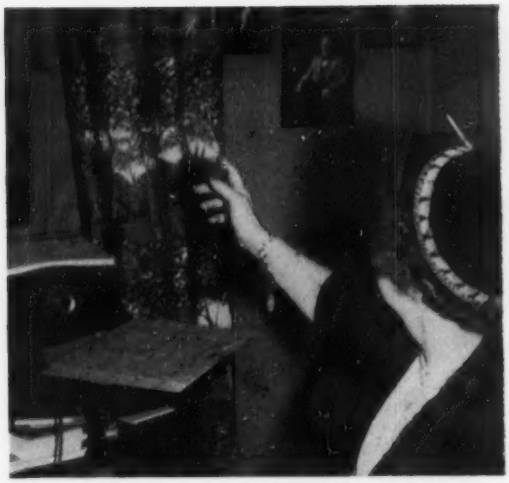
But she has no idea of how many hours she puts into her work each day or each week. "I never think of them as hours because I enjoy them," she explains.

Mrs Kessler got into the business of regulating 622 utilities (including electric, gas, transportation, and water companies) back in 1949 when Republican Gov Alfred E. Driscoll appointed her to fill out the remainder of another member's term. (Mrs Kessler is a Democrat. New Jersey law provides the commission be made up of two members from one party and the third from the other party. At the time of Mrs Kessler's appointment there were two Republicans on the commission.)

Mrs Kessler compares herself to the man who came to dinner. "Once I was in office," she says, "they couldn't get rid of me. I was appointed to a full six-year term in 1953."

In New Jersey, the PUC president is appointed by and serves at the pleasure of the governor. When Gov Robert Meyner, a Democrat, took office in 1954, he appointed Mrs Kessler president.

But, says the only woman PUC commissioner in the country, we don't have any politics in utility regulation.



NO LACE CURTAINS in the hearing room for Mrs Kessler, but she did put up some attractive drapes in her own office

## only woman PUC president

Before becoming a member of the commission, Mrs Kessler practiced law with her husband, Samuel I. Kessler, in the firm of Kessler & Kessler. She also served on the New Jersey State Board of Institutions and Agencies and later became a member of the Governor's Committee on Youth.

When she was named to the PUC, Mrs Kessler stepped out of the family law firm and one of her two sons moved in.

Mrs Kessler got her law degree from Rutgers University in 1941. More than twenty years before she had attended Vassar College but left in 1920 to get married.

When she first came to the commission in 1949, Mrs Kessler says it was all very strange to her—and to the persons working for and dealing with the PUC.

"There was some speculation as to when we would put up lace curtains in the hearing room," she recalled. "And there were some who thought a woman wouldn't work out as a commission member."

Mrs Kessler confided that the first time she presided at a hearing she had butterflies in her stomach. The proceedings were to start at 11 am and she got to the hearing room a little early and was arranging papers on the dais when an elderly lawyer walked in. Thinking she was a clerk he asked her when the commissioner would arrive. She replied the commissioner would be there at 11 o'clock and the lawyer went out for a smoke. When he returned and saw Mrs Kessler presiding he incredulously asked his companions who she was and was quite taken aback when he learned she was the commissioner.

"But now we're friends," said Mrs Kessler. "He's a nice old man."

By the time she became president of the PUC, Mrs Kessler said she was no longer a shock to anyone. Though she admits that she is still addressed

## *Utilities Admire Capability of Their PUC President*

Here are a few comments by men who deal with New Jersey's lady PUC president:

**William H. Blake,** vice president in charge of law, New Jersey Public Service Electric & Gas Co:

"Mrs Kessler has always shown a keen interest in and understanding of utility matters. She has acquainted herself with the many details of operation and this knowledge has benefited the public as well as the utilities."

**R. W. Hogg,** treasurer, Atlantic City Electric Co:

"Having a woman on the Public Utility Commission certainly broadens the area of interest and opinions of the commission, but the first requisite, of course, is ability to understand the many complex problems of fair regulation. Mrs Kessler of the New Jersey commission has brought with her not only a woman's viewpoint, but a wealth of experience in dealing with people and the ability to comprehend and appraise the intricate problems of financing, regulation, and public opinion."

## *'Woman of Year' Award Given by Essex Group*

Last month Essex County Council of Women's Service Clubs honored Mrs Kessler by naming her Essex County's Woman of the Year. With her in above picture are Judge Libby Sachar (center) and Mrs Alice Garthwait (right).

as "sir" at times when she is conducting a hearing.

About the only time her sex has interfered with her position as PUC president, says Mrs Kessler, is when the annual busmen's picnic rolls around. "They always invite me," she confided, "but I know all those men would have a better time without a woman around, so I don't go."

Mrs Kessler believes her duties as president of the PUC are seeing to it that utilities give safe, adequate and proper service, that the public is charged just and reasonable rates, and that companies make a fair and reasonable return on their investment.

In New Jersey it is the practice to figure rate base on fair value, although the commission is not bound to use any single formula or combination of formulae to determine fair value. A 1950 court decision leaves the determination of fair value to the reasonable judgment of the commission after all the facts have been ascertained.

In order to arrive at a reasonable rate of return, Mrs Kessler believes, such factors as amount of money invested in facilities, the risk involved, the cost of good management, and ability to raise new money must be taken into account. But in all cases, she declared, the rate of return can never be more than the reasonable worth of the service supplied nor so low as to be confiscatory.

Mrs Kessler's term as commissioner expires in 1959. And although she thoroughly enjoys her work, she doesn't seem too enthusiastic about serving out another six-year term. "I know how old I'll be then. I think the answer will be 'no,'" she explains.

Mrs Kessler also feels that people shouldn't stay too long in one job because "their thinking becomes static and the job is no longer a challenge to them."

So it seems quite probable that Mrs Kessler will give up her "crazy" life and become a full-time instead of weekend grandmother when her present term is ended.

## New California Unit

Southern California Edison Co last month placed in operation 156,000-kw generating unit at its new Plant No. 2 of its Redondo Beach Steam Station. Provisions have been made for a second unit when required.

## Edison's Lamp Inspires Young Poetess

Recitation of an original poem entitled "I Am An Electric Lamp" by Hazel Jordan was one of the features of Commonwealth Edison Co's Light's Diamond Jubilee luncheon held last month in Chicago's Palmer House. The young poetess, age 11, is shown above getting admiring glances from Gwilym Price (left), president of Westinghouse Electric Corp, and Willis Gale, chairman of Commonwealth Edison.

In a keynote address at the luncheon Price bemoaned the fact that the U. S. is rapidly falling behind Russia in the race to produce scientific and technical personnel. Gale presided at the luncheon which was attended by more than 1,000 business and civic leaders of the Chicago area.

## Installation Bid Plans on Hoover Unit Stalled

Installation plans for N-8, the final generator at Hoover Dam, are being delayed, it was learned from Bureau of Reclamation officials, pending an agreement between the City of Los Angeles and the Nevada Colorado River Commission on underwriting of costs and division of energy from the plant.

The Bureau of Reclamation can't call for bids on the major power generation equipment until the city and the commission iron out all phases of the side agreement.

Negotiations, which are reported to have been progressing toward an amicable solution, were being handled for the commission by Alan Bible.

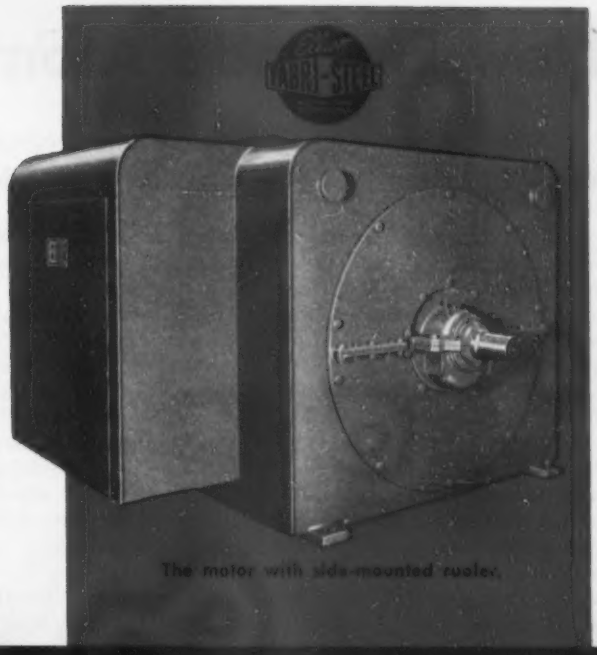
The death of Democratic Sen Pat McCarran, with the sudden launching of Bible into the campaign for U. S. Senator threw a temporary road block into the negotiations.

E. A. Mortiz, retired long-time bureau regional director here, who recently was named to the commission and appointed by Gov Charles Russell as chairman of the engineering committee, is carrying on the discussions.

## Nuclear Ship Study OK'd

Atomic Energy Commission has approved a study of nuclear ship propulsion by Bethlehem Steel Co's Shipbuilding Division. This is the second such study, and it will cover reactor types, steam cycles, control methods, machinery arrangements, and weight. Bethlehem also plans to explore development of a package reactor plant for small land-based power stations or for water distillation plants.

# The economical selection for large motor installations in Class I Division II locations...



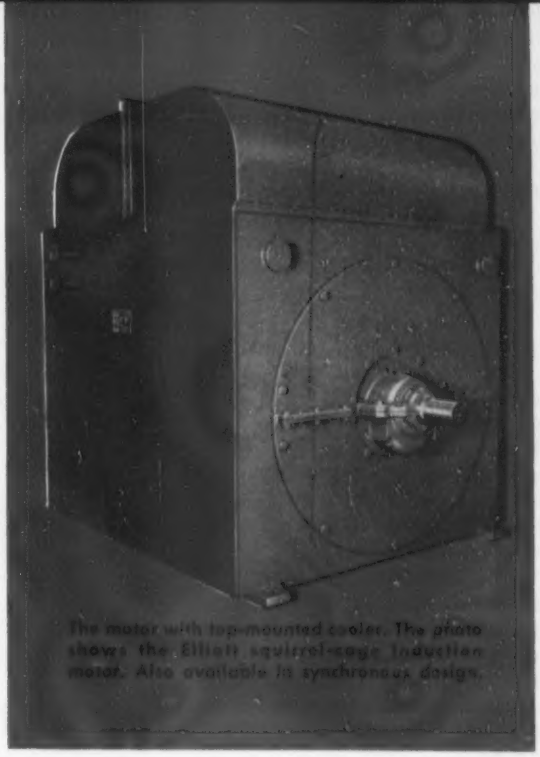

The motor with side-mounted cooler.

# ELLIOTT INERT-GAS OR INSTRUMENT-AIR-COOLED MOTORS

These motors are the modern answer to the problem of motor installations above 900 hp in hazardous areas. They represent a substantial saving over the cost of explosion-proof design, the saving in the larger sizes approaching 30%. Furthermore in comparable sizes they provide greater overload capacity, and their size range well exceeds explosion-proof types, going to 4000 hp.

Elliott "Fabri-Steel" construction makes it readily possible to supply these motors in both the types illustrated. The design is basically that of a totally-enclosed water-cooled motor, filled with inert gas or instrument air at .15 psig. Special seals on the shaft prevent gas leakage. Standard equipment includes indicating pressure gauge, low pressure alarm, and pressure regulator. Also, for inert gas, manifold and wall mounting brackets for gas bottles.

Your local Elliott field engineer has full details, or write Elliott Company, Ridgway Division, Ridgway, Pa.



The motor with top-mounted cooler. The photo shows the Elliott squirrel-cage induction motor. Also available in synchronous design.

**ELLIOTT Company**

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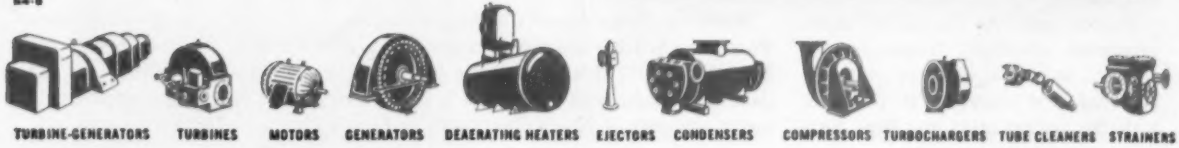


TURBINE-GENERATORS TURBINES MOTORS GENERATORS DEAERATING HEATERS EJECTORS CONDENSERS COMPRESSORS TURBOCHARGERS TUBE CLEANERS STRAINERS

# New England's Atom Role Stressed

**Atomic forum meeting in Boston cites region's need for absorbing nuclear power. Strauss, Cisler, Dean address parley**

New England's role in the atomic power field was analyzed before 400 industrialists at a conference on the region's nuclear power opportunities held in Boston Oct. 20. The parley was sponsored jointly by the New England Council and the Atomic Industrial Forum, Inc, of New York.

Lewis L. Strauss, chairman of the Atomic Energy Commission, told the meeting that New England has the greatest need for cheap electric power from nuclear energy. He said he was amazed to learn that the average bill for 250 kwhr in New England homes was $1.35 higher than elsewhere. The nation's average is reported to be approximately $7.10.

**New England Can Absorb A-Power . . .** The AEC official said New England, because of its historic and geographic industrial advantages, has potentials for absorbing nuclear energy. But, he continued, the area needs new plants, machinery, and methods to restore it to its former industrial pre-eminence.

In stressing research reactors, Strauss reported that AEC has drafted a design, construction and operating code for research reactors. Strauss, in commenting on fuels, said that within the next decade or two nuclear fuel will provide electricity at least competitive with conventional fuels.

Strauss also reported that Brookhaven National Laboratory, Upton, N. Y., has developed to the pilot plant stage a system for fixing or immobilizing radioactive waste materials on cheap, natural clays, which shows promise not only for disposal, but for practical storage.

New England is an appropriate place for an atom plant to be located. This belief was expressed at the meeting by Robert Brandt of the New England Electric System and chairman of the planning committee of the Electric Coordinating Council of New England.

Brandt said, "As the cost of atom-generated electricity comes down, clearly economic success will be achieved first wherever it competes with the highest costs and New England is one of the high cost areas."

Load growth trends, according to Brandt, indicate that by 1975 the utilities of New England will install new generating capacity to the extent of better than 4 million kw as a minimum estimate and maybe more than 7 million kw. But, he added, power represents around 1% of the value of our industrial products and is by no means the vital item which determines the survival of industry in New England.

**Warns Against Over-Optimism . . .** Brandt, therefore, issued this warning: "Atomic electricity will not come to us as a cure for all our inherent difficulties. It can only operate to counteract one item, namely, the cost of fuel, which averages to be about 35¢ a million BTU or 50% higher than the national average.

The new atom law was given attention at the meeting by Walker Cisler, president of both Detroit Edison Co and the Atomic Industrial Forum, Inc, and Gordon Dean, former AEC chairman who is currently with Lehman Brothers, New York.

Cisler declared that the 1954 change in the atom law establishes a beachhead in the approach to peaceful development. He said there soon will be 100 million kw in interconnected generating plants in this country, 75% of which are fuel burners. By 1975 or 1980, he continued, it seems likely that 25% of plant capacity will be atomic as to fuel. He looked hopefully upon breeder type of reactor from the potential efficiency viewpoint, both as to operation and financial aspects.

**A-Law Aids Technical Progress . . .** Dean predicted that technical strides will be faster under the new atom law. Within three years, he said, America should be able to sell small reactors abroad. He declared that manufacturers aim to produce at least 100,000 kw of these in the next two years.

New England's atomic energy efforts in many fields were also stressed in the conference's 23 separate panel sessions. Fields covered were electronics, metallurgy, chemistry, medicine and food and agriculture.

## NSP Adds Its 700,000th Meter

Northern States Power Co (Minnesota) hit the 700,000th meter mark when Pres Allen S. King last month hooked up a gold meter at the home of Mr and Mrs Donald E. Prill. The Prills are shown above with their eight year old daughter, Diana, and year and a half old son, David. Installation of the gold meter was part of NSP's observance of Light's Diamond Jubilee.

No. 8 IN A SERIES

a Sub-Station Engineer ASKS—

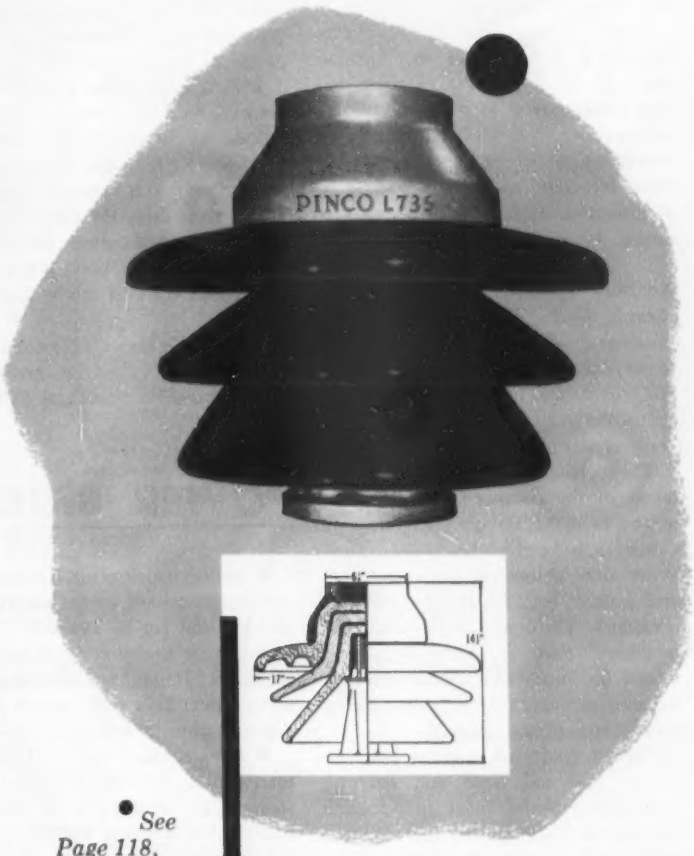
**"what are the advantages of a larger second shell on the PINCO 735 switch and bus unit?"**

## here's the answer...

Prior to the introduction by Pinco of this improved, larger second shell design, all switch and bus units were susceptible to cascading in stacks, which of course was not desirable. Today, however, the Pinco 735 Switch and Bus Stacking Unit, with its larger second shell, improved center design and more rugged porcelain, shows far superior flashover performance and eliminates cascading. In addition, it also provides extra leakage protection and increased mechanical strength.

## another PINCO "FIRST"

The design characteristics shown in the Pinco 735 have proven their superiority by "*right on the job*" performance in years of widely varied service in all voltages. The abilities and facilities responsible for this and other outstanding examples of Pinco pioneering leadership in insulator and special porcelain design and manufacture, are at your service. We invite you to—PUT IT UP TO PINCO!




• *See Page 118, Pinco Catalog No. 49 for complete electrical and mechanical specifications*

**PINCO 735 SPECIFICATIONS**

| | |
|---|---|
| Dry Flashover | 160,000 volts |
| Wet Flashover | 95,000 volts |
| Leakage Distance | 33" |
| Torsion Strength in lbs. | 40,000 |
| Tension Strength, lbs. | 20,000 |

**The Porcelain Insulator Corporation**
LIMA, NEW YORK

PINCO INSULATORS

RIGHT ON THE JOB—

# States Agree on Columbia Pact

## Interstate compact drawn up after two years of work. Accord goes to legislative bodies in January

Seven Pacific Northwest states and the federal government have reached final agreement on dividing and using Columbia River waters through the year 2000 under terms of the Columbia Interstate compact.

The Columbia Interstate Compact Commission will meet in Portland Nov. 11 to review the compact before submitting it to state legislatures in January. The final draft compact represents more than two years of work by commission members from Washington, Oregon, Montana, Wyoming, Utah, and Nevada.

**Advisory Agency . . .** The commission regards the permanent compact commission as a recommendatory agency to consider all projects in the Columbia basin and advise the member states, the federal government or Congress on them.

The permanent commission, under terms of the compact, would be required to make a recommendation to Congress on power reservations and water uses connected with any federal project begun after the compact is ratified. The commission could find, however, that a recommendation would be impractical on a federally licensed project, that is, a private or non-federal public project.

Calvert Anderson, commission secretary, said the legal and drafting committees would meet in Spokane for a final discussion of the compact language before the Portland session, the commission's last of the year. Chairman of the legal committee is R. P. Parry of Twin Falls, Idaho, and chairman of the drafting committee, is Lloyd I. Wallace, who comes from Polson, Mont.

**Power Apportionment . . .** The commission membership agreed at a recent Spokane meeting on the two final knotty problems of writing the document: water apportionment and power reservations.

The compact will provide that the permanent commission will be responsible for reviewing any project begun in the Columbia Basin and recommending that the total "at site" power be reserved to the state in which the project is located.

The commission will also consider the downstream benefits of the project, and recommend a reservation of power for the state amounting to a "fair and equitable share," in the language of the compact.

Should a state use enough Columbia or tributary water in irrigation to reduce the river flow, then its power apportionment would be reduced in proportion. For purposes of evaluating river flow, the commission will use 1948 as a standard, since the Bureau of Reclamation completed a thorough depletion study that year.

**Upstream Rights . . .** Upstream areas of the basin would be given unrestricted right to beneficial (irrigation, navigation, etc.) uses of river water until the year 2000. This clause guarantees irrigation development until 2000, commission members explained. For a dividing line, they chose the summit of the Cascade mountains, so that Washington and Oregon lying east of the summit, and Idaho, Montana, Nevada, Utah, and Wyoming would be considered upstream areas.

Parenthetically, Secretary Anderson points out that the Columbia Basin Interagency Commission has forecast no water shortage on the Columbia for any purpose before 2008.

At the year 2000, the Compact Commission can extend the provisions of the compact, but not beyond the year 2050, or they can undertake the task of apportioning water among the member states if that seems to be advisable.

With the final draft compact virtually completed, the compact commission now proposes to prepare model bills for the seven state legislatures concerned, and draft proposed enabling legislation for Congress.

# POWER BRIEFS FROM THE NEWS

● Southern California Edison Co has ordered installation of a second 156,000-kw unit for its $46-million steam station now under construction at El Segundo. Initial unit will be put in service next July with second unit set for operation in September, 1956.

● Appalachian Electric Power Co plans to double the capacity of its steam plant at Glen Lyn, Va. Estimated to cost $26.4 million, the new unit will have a capacity of 225,000 kw, raising the plant's capability to 395,000 kw. Construction work on the unit is expected to start this fall and will be completed late in 1956.

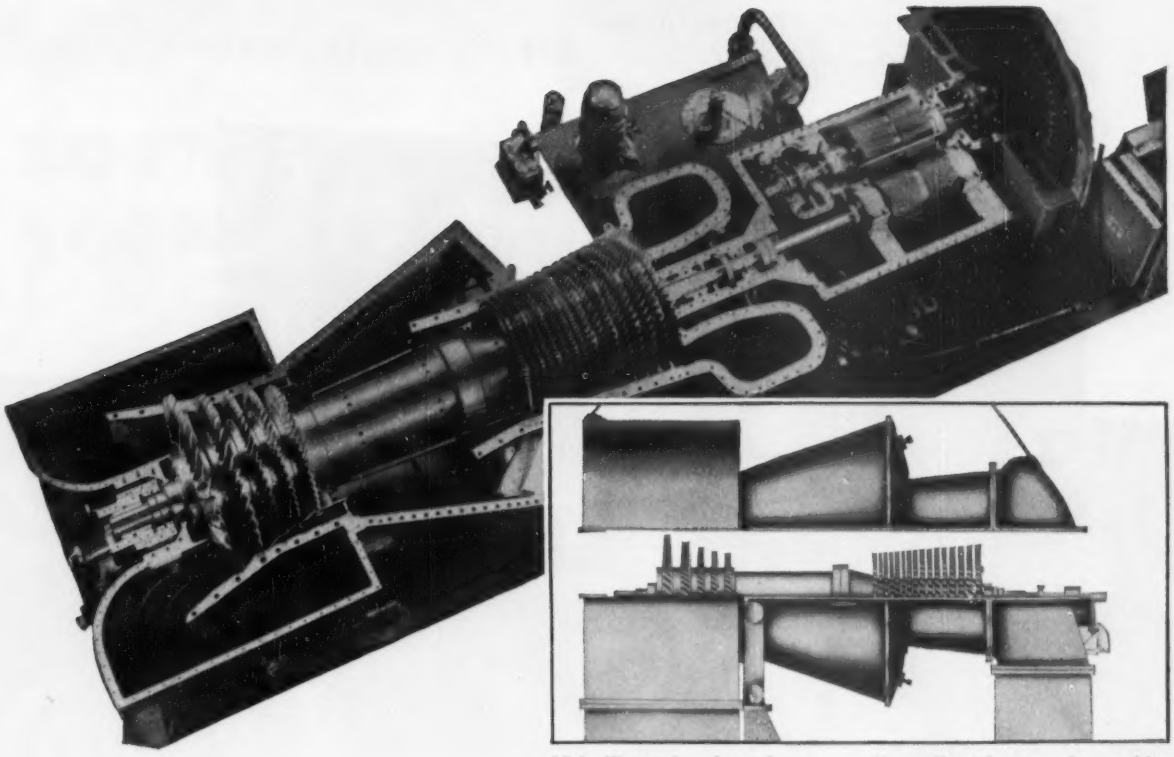
● Addition of a 100,000-kw unit at its Grand Tower power station in Jackson County has been authorized by the Central Illinois Public Service Co.

● Construction of Pacific Gas & Electric Co's $37.6-million, 106,000-kw, hydro project on the North Fork of the Feather River has been authorized by the company. Project will consist of a concrete diversion dam 60-ft high about 2 miles downstream from PG&E's Cresta powerhouse, a tunnel 6½ miles long with a surge chamber at the downstream end, two steel penstock pipes, and the powerhouse which will have two generating units.

● New 220-kv power line of the Societa' Idroelettrica Piemonte from Avise to Turin, Italy, was expected to be completed last month. Reported to reach the highest altitude in Europe by a high voltage transmission line, it attains an elevation of 9,580 ft above sea level in the Italian Alps. Its length is 70 miles. The towers stretch for a length of 42 miles, 12 of which are at an altitude between 6,500 and 10,000 ft.

● A 100,000-kw addition to the new North Omaha power station has been approved by the directors of the Omaha (Neb.) Public Power District. Work will begin immediately, and it is expected to be in commercial operation by May 1, 1957.

● Atlantic City Electric Co is planning to build a 100,000-kw steam plant at Beesley's Point, south of Cape May, N. J. Construction, estimated at $18 million, probably will not start for about two years and is expected to take about three years to complete.



Main illustration shows how center line split makes complete turbine easily accessible. Flanges for separate bearing covers can be seen at either end of rotor shaft. Easy casing removal using overhead hoist is demonstrated in side view above.

## WESTINGHOUSE 5000-KW GAS TURBINES . . .

# Split down the center line . . . to save inspection time, ease maintenance

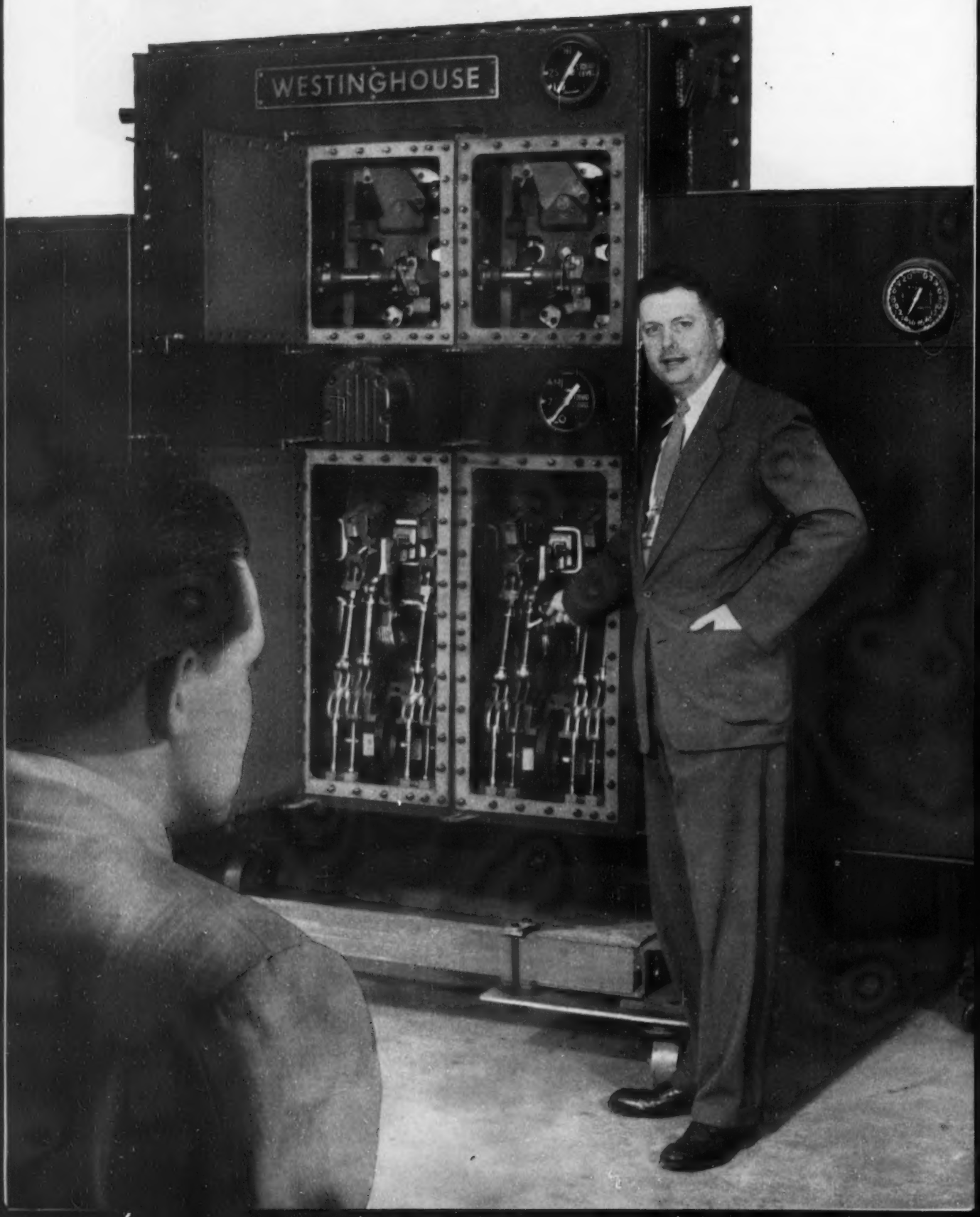
The entire turbine and compressor on this Westinghouse Gas Turbine are exposed by just lifting one single casing. Inspections are quickly made using light lifting equipment in readily available overhead space—hazardous manhandling and rigging at floor level being kept to a minimum. Lifting is logical, too, because it follows long-established electric utility practice . . . is the most *expeditious* way to open any turbine. Westinghouse also uses split bearing casings to ease maintenance. With no bearings buried inside, each end bearing has its own separate cover plate. This *end* bearing construction also eliminates hot seals and special bearing cooling. It's an important maintenance time saver.

These and such other features such as easily removed radial combustors and no high-pressure internal air or gas seals recommend the Westinghouse 5000-kw Gas Turbine for electric power generation. Use it for base load where fuel is cheap; for reliable peak, stand-by and end-of-line loads; for locations where water is scarce or expensive, or where mobile or semi-mobile plants are required. Let experienced Westinghouse Power Plant Engineers help solve your generation problems with one of the above applications. Get the complete story from your local Westinghouse office or by writing Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-50563

YOU CAN BE SURE...IF IT'S

Westinghouse

*setting the pace of transformer design for the industry*



NEW URT TAP CHANGER . . . THE MOST DURABLE EVER BUILT!

# 300% more fault capacity 200% faster arc quenching

The new Westinghouse URT Tap Changer, for 15,000 through 100,000 - kva power or regulating transformers, combines the rugged construction and proven direct-drive mechanism of the superseded UNR with new features to provide you with the longest, trouble-free service, yet. For instance—

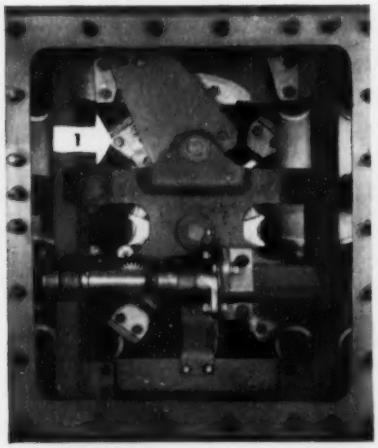
**New contact design** on the moving contacts of the selector switch and main stationary contacts of transfer switches provides 300% greater current-carrying capacity for operation under fault conditions. It accomplishes this through magnetic attraction between two spring-loaded copper bars with coin silver contacts. Proper contact is maintained for normal loads and as fault current value increases, magnetic attraction between the bars increases contact pressure as needed. Spitting—hot spots—contact welding are thus eliminated.

**New arcing switch** for the transfer switch assembly decreases arcing time, for example, from a full cycle to one-half cycle—an improvement of 200%. A double-butt arcing contact, with an arcing chamber and magnetic "blowout", makes this possible. The inserts of the main arc tips have a greater than ever life potential.

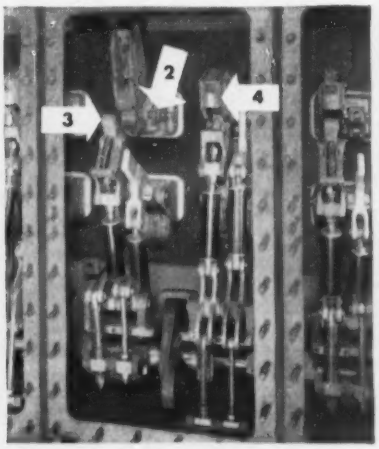
The new URT simplifies inspection, too. Each selector and transfer switch has its individual door—held with stud protecting cap nuts. No more reaching around or through other phase units.

This TCUL development, and the many preceding it, is tangible evidence of the Westinghouse tradition in setting the pace of transformer design for the industry. For more information call your nearby Westinghouse Representative or write Westinghouse Electric Corp., 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pa.

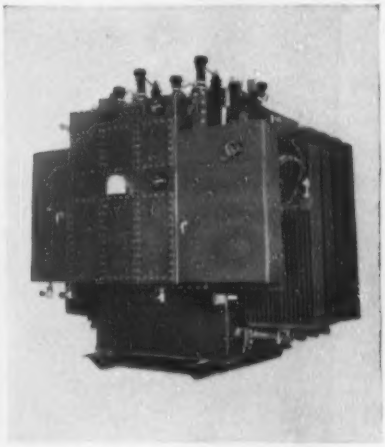
J-70733




*300% greater fault-current capacity* in this selector switch moving contact (1), and main stationary contact of the transfer switch (2), through principle of magnetic attraction.




*200% faster arc quenching* is provided by the combination of a double-butt arcing contact (3), arcing chamber and magnetic "blowout" (4) ... for increased contact life.



Note single, compact housing for all components of the URT. Front-operated demountable doors individually house all selector and transfer switches.

YOU CAN BE SURE ... IF IT'S Westinghouse

FOR FASTER HANDLING...

GREATER PROTECTION...

MORE ECONOMICAL STORAGE

**Wagner**

# Small Distribution Transformers*

## NOW SHIPPED to you IN DRUMS

Wagner Type HEK—10 kva Distribution Transformer

There's no need to worry about damage from dust, dirt or grease to pole type distribution transformers while they're in transit or in storage... IF you've specified Wagner. Wagner Types HEF and HEK Transformers are now shipped to you completely protected—securely mounted in 8-ply fibre drums.

Drum-packed transformers are easier to handle, take 25% less storage space and are less likely to be damaged during shipment than transformers packed in ordinary crates. It's a simple matter to move these drums with a hand hoist or a fork truck. Four Wagner Transformer drums fit on a standard pallet and may be stacked three high.

### Wagner Distribution Transformers Offer These EXTRA Features:

Wagner's Shur-Seal Clamping Ring seals the covers on round tank transformers and prevents "breathing."

New Tank Wall Bushing... Positive position locks for porcelain and terminal prevent loose connections on inside end of terminal studs and provide greater safety to linemen when connections are being made.

Wagner Form W Transformers are small and light in weight but are liberally designed to assure dependable performance.

Wagner Distribution Transformers are filled with inhibited oil to reduce oxidation and retard the formation of acids and sludge... you get extra years of service-free transformer life.

***Write for your copy of Bulletin TU-180. It gives complete information on Wagner Distribution Transformers.***

*Types HEF and HEK—3 through 10 kva.

**WAGNER ELECTRIC CORPORATION**

**6456 Plymouth Ave. • St. Louis 14, Mo., U. S. A.**

ELECTRIC MOTORS - TRANSFORMERS - INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS - AIR AND HYDRAULIC

Wagner Electric Corporation
EST. 1891

**BRANCHES IN 32 PRINCIPAL CITIES**

T54-17

## Corps Pours Last Concrete at Dexter Dam

Army Corps of Engineers schedule for Dexter Dam calls for the last concrete to be poured this month. The $12-million project, a reregulating dam for Lookout Point Dam three miles upstream, is on the Middle Fork Willamette River near Dexter, Ore. It is part of the Lookout Point Reservoir Project, key unit in the Willamette River Basin Project. Visible in above picture are concrete spillway, earth-fill section at right, and powerhouse and fishway to egg collecting station at left.

The Corps already has begun impounding water behind Dexter Dam. Its 15,000-kw powerhouse is scheduled to go into service in April of next year.

## Colorado Co-ops Weigh Plan for New G&T System

Colorado area cooperatives are coming up with ideas for setting up their own generating and transmission systems. Estimates of combined costs run about $25 million.

Representatives of the Colorado Ute Electric Association and the Western Colorado Power Co have just completed a week-long conference with Rural Electrification Administration people in Washington. They have been working on a plan to build a new G&T system with about $9 million in REA money. Plans call for a 20,000-kv steam generation plant and about 150 miles of transmission line. Idea is to integrate this new system with the power company's existing system to cut power costs.

No site for the plant has been selected, pending further engineering studies, nor has a formal application been made to REA.

These co-ops are also seeking REA financing: Tri-State Generation and Transmission Association, Inc, which is preparing an application for a $10.5-million G&T loan; and the Southern Group, which seeks a loan of more than $3 million.

Distribution co-ops which make up the membership of the Colorado Ute Association are: San Miguel Power Association, Nucla; Delta-Montrose Rural Power Lines Association, Delta; La Plata Electric Association, Inc, Durango; and Empire Electric Association, Inc, Cortez.

## AEC's Top Staff Changes Linked to New Atomic Law

The Atomic Energy Commission has rearranged its staff at top levels to fit its machinery to new atomic law. All appointees are AEC staff members.

Changes are:

Harold L. Price will continue as deputy general counsel as he takes on the post of special assistant to the general manager for licensing.

Elbert B. Johnson, former chief of the controller's investigative staff, is acting director of the new Division of Inspection. Functions of the investigative staff he headed have been transferred to the new division.

Richard W. Cook, assistant general manager for manufacturing, is now also deputy general manager. Cook has directed AEC's negotiations on Dixon-Yates contract.

Harry S. Traynor, special assistant to the general manager, is now assistant general manager.

Roy B. Snapp, former commission secretary, is special assistant to the AEC chairman.

Woodford B. McCool, former assistant to Snapp, is secretary to AEC.

Paul F. Foster will co-ordinate activities of AEC representatives on inter-agency committees, the work of the commission's office of international affairs, and the Congressional liaison staff as special assistant to the general manager for liaison.

## Secretary Benson Admits Error in REA Comments

Secretary of Agriculture Ezra Benson has admitted an error in describing REA's activities, but denied that it was intentional.

In a letter to Clyde T. Ellis, executive manager of the National Rural Electric Cooperative Association, Benson said he regretted "inadvertently" combining the two years 1952 and 1953 in reporting on REA's loan volume. He told Ellis:

"As for your point that I exaggerated REA's work this last year, I regret that I inadvertently 'combined' the two years 1952 and 1953 whereas I should have said—as you so well know—that the year 1954 had a loan program slightly larger than each of the two preceding years."

In answering Ellis' criticism of the program, Benson said he has "always tried to guard the integrity of my words," and stated that in more than a dozen talks before and since the Ogden (Utah) appearance which gave rise to Ellis' remarks, he has "correctly stated the scope of REA activities which should be indication enough that I am not attempting deliberately to misrepresent the situation."

At Ogden Benson had said: "A good deal of propaganda against the Republican Administration of REA is stemming from the NRECA. To read some of the association's bulletins one might think REA had closed its doors and was literally leaving our farmers in darkness and without telephones."

# AIEE MEETING

Merits of the 277/480-v medium and heavy density distribution networks were firmly established in a symposium at the AIEE Fall General Meeting in Chicago, Oct. 11 to 15. A dozen papers constituted a distribution engineers' bible for the next decade of load growth in metropolitan and urban commercial areas. Other themes explored were load relief during system emergencies, effect of low frequency and voltage on plant auxiliaries and capability, and coordinated protection for distribution systems.

Among the significant pronouncements were the justification of correction to high system power factor, use of 400-cycle fluorescent lighting, and prospective use of 1,000 to 1,200 v for fluorescent lighting.

Prevailing delivered voltages of 120/208 on metropolitan networks are proving inadequate or uneconomical. The move is toward the 277/480 bracket for concentrated loads. Eleven papers canvassed the situation not only in New York City but in Peoria and Baltimore. Consolidated Edison authors, headed by A. M. deBellis, first demonstrated that the higher voltage can advantageously be adopted for a multitransformer spot network with multiple radial services to the load. Additional economy will come from use of larger transformers and fewer locations.

The opening paper by deBellis and S. B. Griscom, Westinghouse Electric Corp, was followed by analysis of the economics of various possible voltages for metropolitan commercial areas. The authors, T. C. Duncan, J. P. Newbauer, and J. M. Comly of Con Edison along with R. F. Lawrence and Miles Maxwell, Westinghouse, found savings up to 35% where load density ranges from 10 to 240 Mva per sq mile—enough to warrant adoption as an adjunct to the prevailing 120/208-v network. The 460-v spot-plus-radial system is superior, they find, to the straight 460-v network for load densities of 60 Mva and up.

To serve the heavier loads at these higher voltages will require improved fuses for network back-up protection and limiters to protect the cables. No essential difference in plan of supply was envisioned by the four Con Ed authors (L. Brieger, C. P. Xenis, A. J. Bisson and J. deBellis) merely the larger (2,000-kva) transformers and 3,000-amp protectors. The silver-sand fuse would be appropriate because it generates a third less heat than the comparable copper fuse.

Attention was called by L. G. Smith, Consolidated Gas, Electric Light & Power Co, to the problem of the shopping center, some necessitating 33 kv to serve as much as 4,000-kva load. He urged that means should be found to circumvent the objections to two voltage ratings of appliances when higher voltage is adopted. One point is to render the devices convertible by reconnection to the higher voltage.

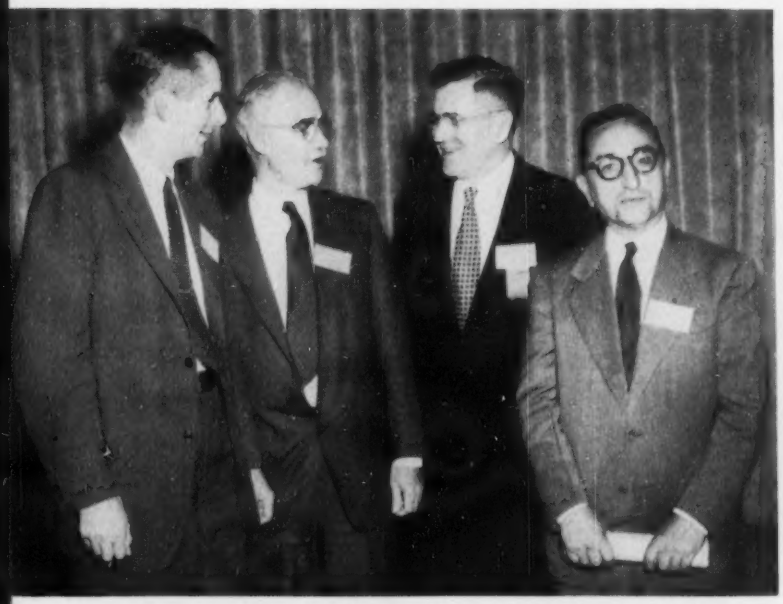
Philadelphia Electric does not see the need for higher voltage distribution, said L. R. Gaty, adding that its rate structure encourages customers to buy at primary voltage as soon as the load approaches the point where conventional secondary voltage would be inadequate. Present

(*Continued on page* 32)

A. C. MONTEITH, left, Westinghouse Electric vice president and AIEE president; Donald Quarles, Assistant Secretary of Defense; F. A. Fox, Commonwealth Edison Co, chairman of General Committee; N. S. Hibshman, National Secretary AIEE

*Fall general sessions at Chicago bring out merits of 277/480-v distribution for heavy networks*

L. C. ROSENBERG, Allis-Chalmers Mfg Co, P. L. Dandeno, Ontario Hydro-Electric Power; C. F. Paulus, Cleveland Electric Illum.



L. R. GATY, left, Philadelphia Electric Co; J. B. Hodtum, Allis-Chalmers Manufacturing Co; S. A. Warner and C. P. Xenis, both of Consolidated Edison Co

C. I. HENDRICKS, Texas ES; M. L. Manning, Pennsylvania Transformer; A. R. Waehner, Line Material

LOOKING OVER URANIUM SAMPLES at Nucleonics Session are Joseph Harrer, left, and Stuart McClain, both of Argonne National Laboratories; and W. E. Barbour, Tracerlab

# RM POWER TRANSFORMERS

## *the benefits of ASA standards*

### RM* brings you all these benefits

Repetitive Manufacture gives you the economy of a standardized product, yet with optional ratings and accessories sufficient to meet most special needs. Ordering is simpler, shipment is many weeks faster, and prices are up to 8% less than those of nonstandard units.

**RM is the G-E designation for ASA-standardized power transformers 69 kv and below; 501 through 5000 kva single-phase, and 10,000 kva three-phase.*

LOWER PRICE

# plus . . . . . Superior rust prevention

## *because Super Melaglyp paint finish lasts up to 150% longer*

When you need a transformer in the medium range, order a G-E Repetitive-Manufacture transformer, and you'll get all the benefits of ASA Standards, plus exclusive features that give you better performance, easier handling and less maintenance.

**SUPERIOR RUST PREVENTION,** for example, is obtained with Super Melaglyp—General Electric's new outdoor paint finish. Lasting up to 150% longer than previous finishes, Super Melaglyp is applied to all transformers manufactured at G.E.'s new Medium Transformer Plant.

Completed tanks are first cleaned by blasting to remove scale and to prepare the surface for the application of the three-coat paint system. After leak testing, the tanks are given a primer coat pigmented with rust inhibitors to prevent corrosion and two finishing coats of Super Melaglyp. Each coat is thoroughly baked on at 150 C before the next one is applied.

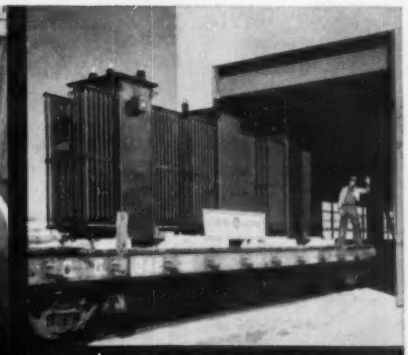
The result is the smoothest, most durable outdoor paint finish obtainable today. It protects equipment better and lasts longer — saving repaintings. Super Melaglyp averages 50% longer life. In salt and chemical atmospheres it has an increased resistance of 75% or more over the previous finish.

**MANY OTHER BENEFITS** result from the advanced methods and processes used in General Electric's new plant at Rome, Ga. These include high dielectric strength because vapor-phase drying removes entrapped moisture, stronger liquid-tight tanks because submerged-arc welding strengthens major tank joints, and quicker delivery from faster, conveyorized production. Built solely to produce power transformers in the medium range, this plant serves electric utilities and industry by turning out better transformers in shorter time. You can get full information about RM power transformers by contacting your nearest G-E Apparatus Sales Office, or by writing for Bulletin GEA-6108 to General Electric Co., Section 422-12, Schenectady 5, N. Y.

*Progress Is Our Most Important Product*

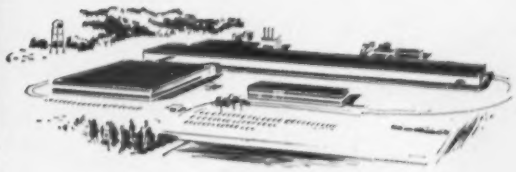
**GENERAL ELECTRIC**

SIMPLIFIED PURCHASING



SHORTER SHIPMENT

**G.E.'s NEW, ROME, GA. TRANSFORMER PLANT—built specifically to meet the growing trend to standardized power transformers.**



secondary voltage is thus adequate for a quintupling of present loads.

The 240/416-v lift was favored in a discussion presented for A. J. Panzini, Long Island Lighting Co, largely because 3-phase is unjustifiable as carrying charges are 50% higher than for single-phase with autotransformer to take care of 120 v. Also the avoidance of 3-phase removes some of the agitation for underground. Panzini was disturbed by the prospect of a whole new line of transformers and meters if 277/480 v should prevail and extend to residential systems like his company has predominantly.

Other comment (F. C. Fisher, Consumers Power Co) was that full consideration should be given to the impact upon the meter and the utilization apparatus before fixing on 277/480 for commercial and industrial loads with subsequent application to residential. W. R. Bullard, Ebasco Services, hoped that similar study would be accorded to loads in areas other than metropolitan. He added that it seemed unfortunate to put so much stress on a 277/480-v value when the industry is already at work seeking the optimum over-all value with due consideration to appliances, wiring, etc.

Study of the commercial underground system in Peoria was directed at extension of the prevailing 120/208-v network, substitution or addition of a 277/480-v network or a combination of either with "spots" of the other. The 277/480-v system was found some 10% cheaper than the 120/208 or the latter with 277/480 spots, and the development will therefore follow along the 277/480-v line. The authors (E. Rothfus and J. R. Oberholtzer, Commonwealth Associates, and W. R. Folck, Central Illinois Light Co) warned that the conclusion does not embrace changeover from the 120/208-v because of prohibitive costs.

**Distribution Performance . . .** Three year data on some 11,700 circuit-mile years showed that wind and trees cause 46% of the faults, lightning 19%, and equipment and wire failures a mere 11%. Three out of four faults occur in the span rather than at the pole. The joint AIEE-EEI committee also reported that three out of five faults are temporary by nature and that conductor spacing is a significant construction factor. Damage to covered conductors smaller than No. 4 usually cannot be prevented except by line shorting devices and smaller sizes of oil circuit reclosers and fuses. The group reported a distinct need for higher operating speeds on conventional circuit breakers and more effective types of highspeed protective systems.

**Oil Circuit Reclosers . . .** Consumers Power has more than 1,300 reclosers on the 750,000-customer, 35,000-mile pole-line system installed over 8 years. They cost a fifth as much as conventional oil circuit breakers, said A. C. Fagerlund and G. D. Stevens. In 1953 there were 1,100 in service, and they had 3,523 operations. Only 47 were lockouts, and it is estimated that at least 438 interruptions would have occurred if repeater fuses had been used instead of reclosers.

After a series of breakups of the Northwest interconnected system the BPA adopted a definite program for load shedding with successive steps geared to the severity of the disturbance. Manual dropping of loads is coupled with automatic dropping based on an under-frequency relay trip. Sags to as low as 49 and even 42 cycles were reported in the paper by J. O. Swanson and J. P. Jolliffe. In the latter instance voltage fell to 65% momentarily it was stated.

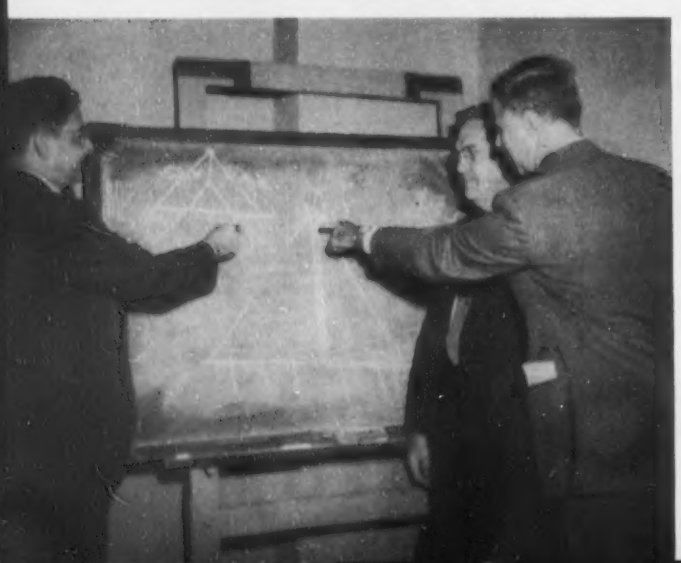
Houston Lighting & Power had a sequence of somewhat comparable system disturbances. Sectionalizing of the interconnection system was likewise replaced by reliance on under-frequency relays placed in each substation to trip selected feeders by load relief. Latest designs of the under-frequency relays are relatively insensitive to voltage drop and therefore permit closer coordination of steps in programmed load shedding, said W. C. Gierisch.

**Load Shedding Problems . . .** Differences in British and American practices were brought out in a series of papers dealing with experience in getting load relief by reducing system frequency and/or system voltage. British practices favor frequency reduction. This was brought out in a paper by J. P. Squire, British Electricity Authority, presented by E. L. Michelson, Commonwealth Edison Co. American practices favor voltage reduction. This was the conclusion of three papers. Reason for the differences, Michelson said, appeared to be that the British system could reduce frequency because it was not interconnected.

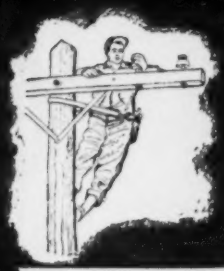
Greater results, in the form of load reduction, were obtained by combined voltage and frequency reduction, Richard Holgate, Philadelphia Electric, reported. These conclusions were based on tests at two stations which had separate house generators. Results indicated that voltage could be reduced successfully up to 10% and frequency to 57 cycles. The critical factor in frequency was rotor critical speed and resonant blade frequency.

A 10% reduction in frequency reduces the speed of motor-drives station auxiliaries and will reduce plant output as much as 30%, H. A. Bauman, Consolidated Edison,

(*Continued on page* 36)

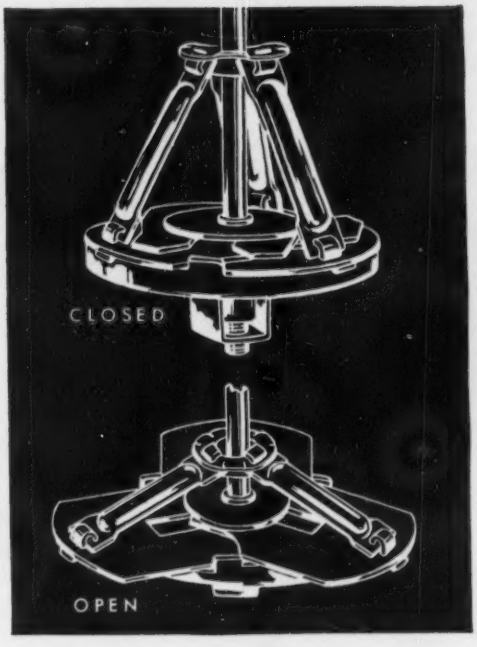


G. W. Fox, Union Electric Co, explains tower problem to G. E. Farmer, TVA, and J. C. Carter, Westinghouse Electric Corp



# LINE CONSTRUCTION BLUEPRINTS

ITEMS SOME COMPANIES ARE USING TO MAKE
LINE CONSTRUCTION WORK EASIER



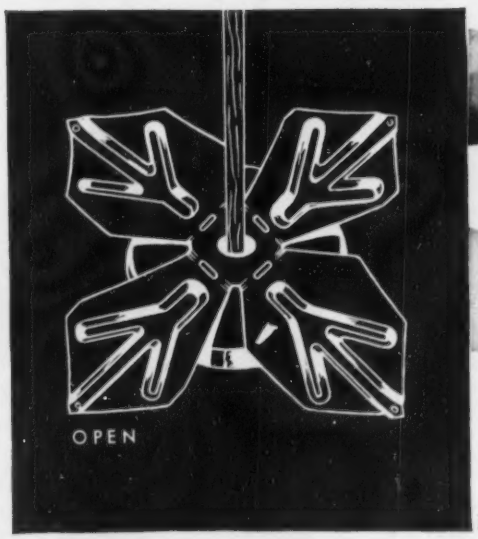

## L-M SLIDING PLATE ANCHORS

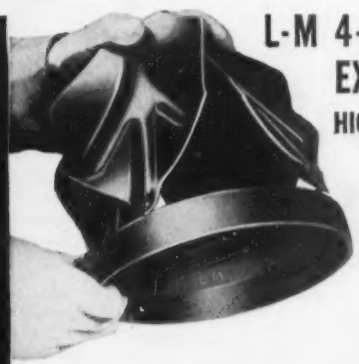
### now up to 20,000 pounds holding power

L-M sliding plate expanding anchors are heavily built, for smooth operation, easy installation, and tremendous strength. As the tamping block strikes the collar, the strong spreader arms give the steel blades a sliding action that cuts into undisturbed surrounding soil quickly and easily. Under tension the spreader arms act as trusses for the blades. These anchors are available in sizes listed below.

**Available in 4 sizes**

| Catalog Number | Nominal Holding Power Pounds | Expanded Area Sq. In. | Type | Diameter Closed Inches | Approx. Net Wt. Lbs. per 100 |
|---|---|---|---|---|---|
| 200015E6 | 6,000 | 94 | 2-Way | 8 | 850 |
| 200015E8 | 8,000 | 115 | 3-Way | 8 | 1100 |
| 200015E10 | 10,000 | 135 | 4-Way | 8 | 1350 |
| 200029B1 | 20,000 | 200 | 4-Way | 10 | 2450 |



## L-M 4-WAY PRESSED STEEL EXPANDING ANCHORS

### HIGH strength, MINIMUM creep

Two-piece design . . . the four blades are formed of a single piece of sturdy steel. The center hole is extruded downwards, which provides a bearing surface against the rod to prevent binding, reinforces the tamping area, and provides an audible signal when the extrusion strikes the base, indicating full expansion.

| Catalog Number | Nominal Holding Power Pounds | Expanded Area Sq. In. | Diameter—Closed Inches | Anchor Rod Diameter Inches | Minimum Mechanical Strengths Without Noticeable Deformation—Pounds |
|---|---|---|---|---|---|
| 200026B1 | 6,000 | 110 | 8 | ⅝, ¾ | 16,000 |
| 200026B2 | 8,000 | 125 | 8 | ⅝, ¾ | 21,000 |
| 200026B3 | 10,000 | 132 | 8 | 1 | 24,000 |
| 200026B4 | 10,000 | 132 | 8 | ⅝, ¾ | 24,000 |

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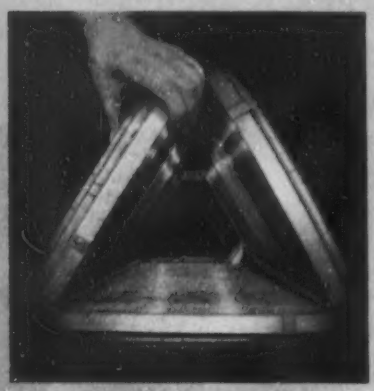
### Do You Have a Line Construction Problem?

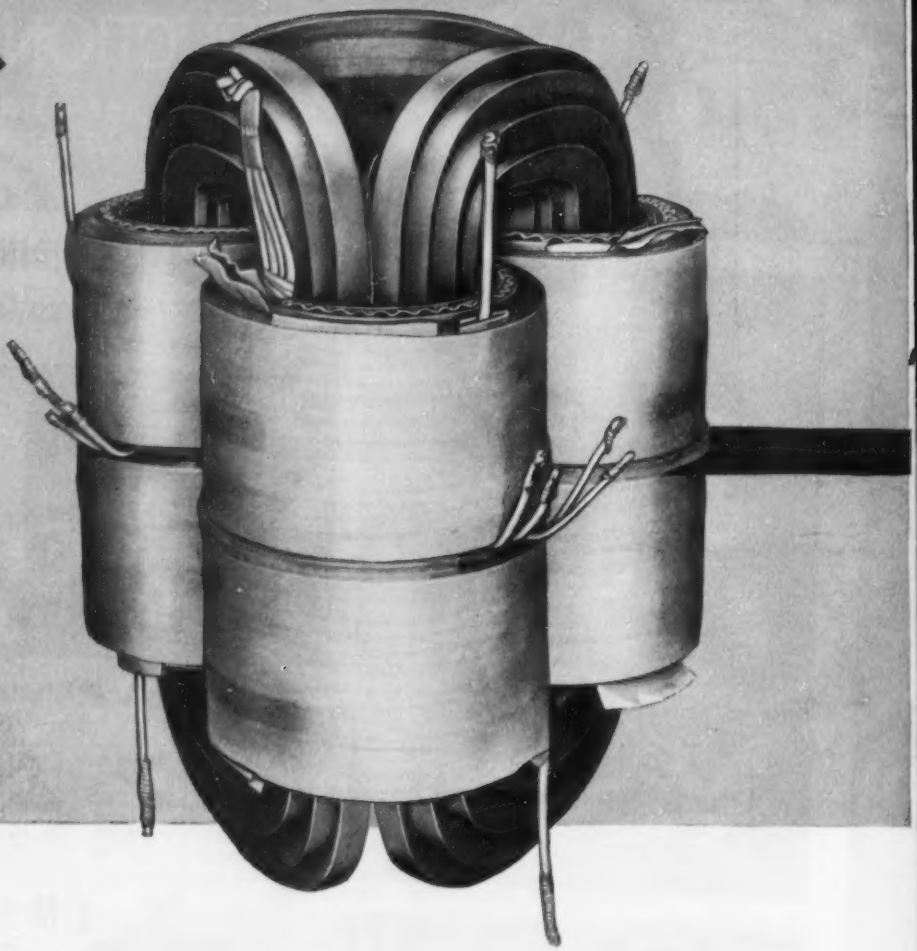
These are just a few of thousands of L-M line construction specialties. If you have a line construction problem, let us know. We may have standard or special items in stock that will solve it. Ask the L-M Field Engineer, or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).

**LINE MATERIAL** *Line Construction Materials*

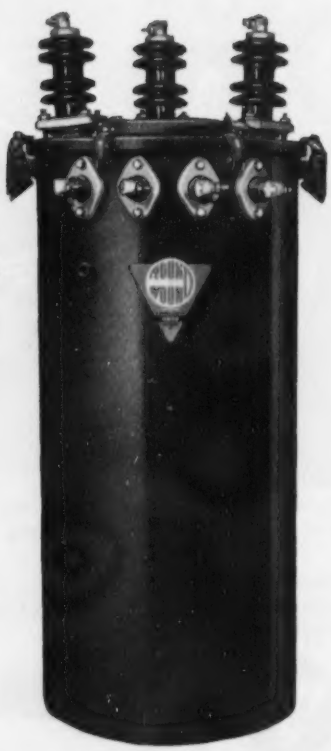
The L-M Tri-Wound core-coil configuration results in a compact and highly efficient structure. The inherent characteristics of the continuously wound core and the round coils offer distinct design and operating advantages.



The core structure consists of three continuously wound cores of oriented-grain silicon steel strip assembled into a balanced magnetic unit.



The new Tri-Wound is built to resist short-circuit forces. Note the strong steel frame and heavy clamping bolts. Sturdy maple blocks at top and bottom are tightened and clamped against the coil ends to prevent axial movement.



Completed Tri-Wound 3-phase transformer. The unit is smaller and lighter than L-M's previous type. The transformer provides all the well-known advantages of L-M's single-phase Round-Wound transformers.

## Outstanding Characteristics of L-M Tri-Wound Transformers

**High short-time overload capacity**

**Good regulation at all power factors**

**High impulse level with ample creepage distance and generous insulation**

**High short-circuit strength**

**Filled with ORTO®, L-M's oxidation-resistant transformer oil, inhibited for longer life**

**Available in sizes 9, 15, 30, 45, and 75 kva**

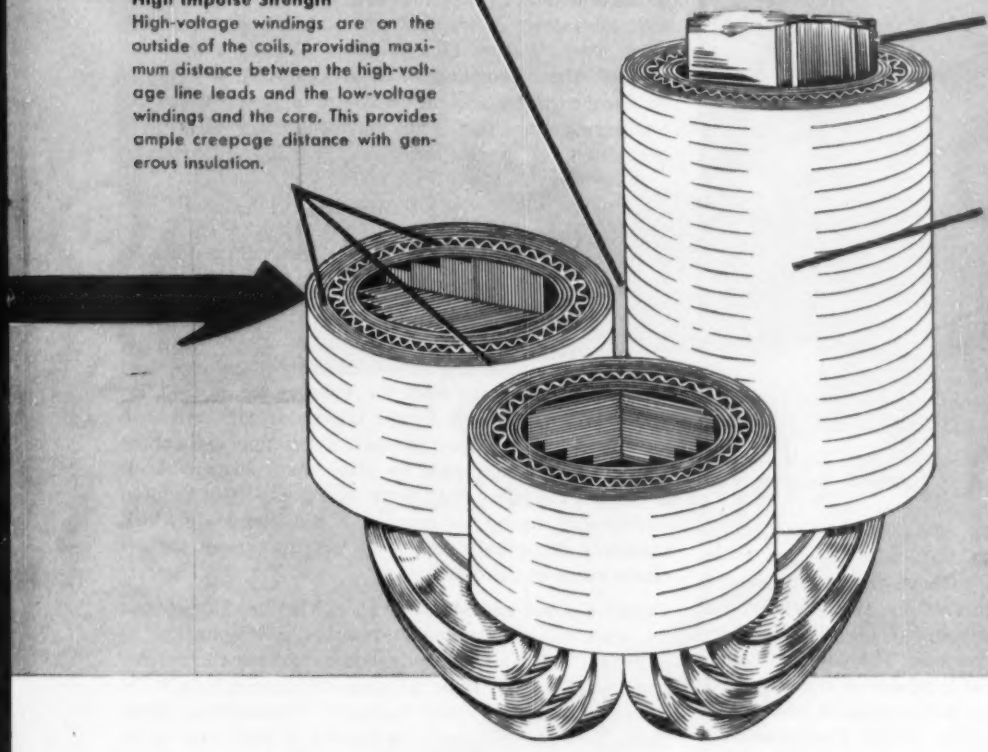
*"Tri-Wound" and "Uni-Wound" are Line Material Company trade-marks.*

**High Short-Time Overload Capacity**
Core clamps are designed to provide a chimney effect between the three coils. This chimney effect plus the exposed outer coil surfaces provides effective cooling. Oil ducts, located throughout the coil, contribute to uniform, efficient cooling.

**High Impulse Strength**
High-voltage windings are on the outside of the coils, providing maximum distance between the high-voltage line leads and the low-voltage windings and the core. This provides ample creepage distance with generous insulation.

**Low Exciting Current**
The continuously wound core of oriented-grain silicon steel strip provides a uniform flux path, thus permitting low exciting current.

**High Short-Circuit Strength**
Round coils naturally resist radial short-circuit forces without damage or distortion. Sturdy core clamps and strong blocking help prevent axial movement of the windings under short-circuit conditions.



## For 3-Phase In 9 To 75 kva Sizes...

# L-M's New Tri-Wound™ Transformers

**Apply Round-Wound® principles to 3-phase construction to provide light weight and small size, high overload capacity, high short-circuit strength, high impulse strength.**

By **JAMES G. EVERHART**
Chief Engineer
Transformer Division
Line Material Company

L-M's new *Tri-Wound* fills the need for a smaller, lighter 3-phase transformer that utilizes the full advantages of a continuously wound magnetic core and round coils. This new Tri-Wound transformer is now available in sizes 9 through 75 kva and in all voltage classes through 13,800 volts.

L-M's larger-sized 3-phase transformers are the new *Uni-Wound*, which provide Round-Wound's balanced performance in sizes from 112½ through 500 kva.

### Continuously Wound Core

The Tri-Wound transformer consists of three cores, continuously wound of oriented-grain silicon steel strip. The bare cores are annealed after fabrication, and placed as shown in the illustration. Then round coils are wound directly onto the three core legs by L-M's exclusive winding process.

### Tri-Wound is Smaller and Lighter

Integrating the core-coil assemblies into one unit provides a substantially lighter, smaller 3-phase transformer. For example, the 75 kva Tri-Wound is approximately 250 pounds lighter than previous designs. In addition, the over-all height of this new Tri-Wound unit has been reduced about 1½ feet, with very little increase in the projected floor space.

### Balanced Performance

Performance characteristics of the Tri-Wound transformer have been coordinated to give good over-all balanced operation, with each characteristic being considered in its relationship to the over-all performance of the transformer.

### Get Details of Tri-Wound Transformers

Ask the L-M Field Engineer to give you full details; or write Line Material Company, Transformer Division, Zanesville, Ohio. (Line Material Company is a McGraw Electric Company Division.)

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**LINE MATERIAL Transformers**

A. C. HARTRANFT, Philadelphia Electric Co.; C. N. Metcalf, Consolidated Edison Co; and A. P. Hayward, Duquesne Light

reported in a paper which he authored with G. R. Hahn and C. N. Metcalf. The paper was based on tests to determine the effect of frequency reduction on plant capacity. Turbine capability was reduced 10%. Their tests showed that frequency reduction without voltage reduction produced no measurable load change. The company therefore uses voltage reduction as a means of rejecting load.

C. J. Swenson, presenting a paper prepared jointly with O. D. Butler, reported on tests by the Commonwealth Edison to determine the effect of voltage and/or frequency reduction on plant auxiliaries. In order to confine tests to auxiliaries only, one unit was isolated. It was found that a reduction in voltage up to 18% could be tolerated for short periods. The critical frequency was 57 cycles. It was concluded that frequency should not be allowed to drop below 58 cycles and that corrective measures should be started at 59 cycles.

**Power Generation . . .** New equipment for limiting under excited reactive amperes for an amplidyne voltage regulator was described by A. S. Rubenstein, General Electric, who presented a paper prepared with M. Temoshok, GE. The ampere limit prevents the ac machine from exceeding the steady state stability limit and gives confidence to operators in initial applications of voltage regulators to ac machines.

In describing motor-driven exciters, Temoshok, in a paper prepared with J. B. Tice, GE, reported several advantages of this type of exciter. It removes the exciter from the generator shaft, reduces the length of the turbine-generator substantially, and may result in savings in building space and crane facilities.

Synchronous condensers can be operated on their system with negative field currents to help offset the capacitance of long high voltage transmission lines during periods of light loads, said K. R. McClymont, Hydro-Electric Power Commission of Ontario. The paper was prepared with P. L. Dandeno. The conclusion was based on two years of experience and on information gained from a number of tests conducted for the purpose of determining the effects of such operation.

**Transformers . . .** Autotransformers in distribution circuits have advantages of low first cost and low operating cost, O. T. Fary, Wagner Electric Corp, told the transformer session. The assumption of infinite capacity and infinite zero sequence reactance in the system imposes unnecessary requirements in design. Each application must be properly engineered.

A new control scheme for parelleling transformers with tap changing under load was proposed by J. Cosar, Ontario Hydro. The scheme was designed to keep transformers of different makes on the same taps. It would reduce circulating current to a minimum; provide fail-safe operation; is simple, inexpensive, yet positive in action; and operating costs will be lower.

Corona detection has been used in the development of insulation for transformers for voltages up to 500 kv, said T. W. Liao and J. S. Kresge, General Electric. An oscillograph method was used for corona detection, and corona streamers were eliminated by using small diameter leads in the test circuit and a "crown of thorns." This reduced interference due to air corona. A dual-frequency, dual-sensitivity detecting element was used to expand the dynamic range of the detector.

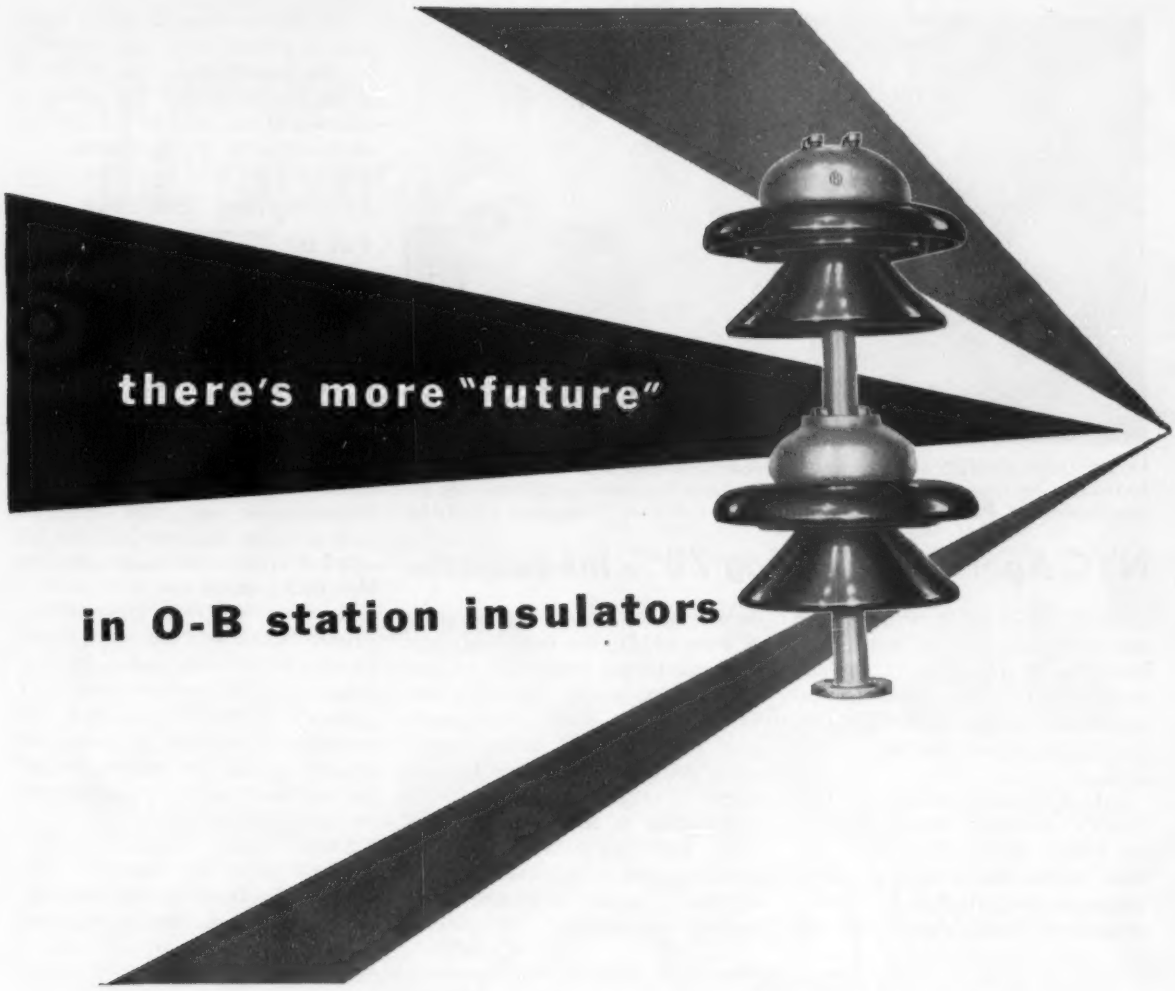
**Carrier Current and Microwave . . .** Carrier channels can be improved by avoiding mismatches and using low Q traps, J. C. G. Carter, Westinghouse, told the carrier current session. Apart from this tone frequencies have to be chosen carefully to avoid harmonic relationships. Tone applications, he said, may be limited to functions where non-operation or false-operation would not have serious consequences.

**Switchgear . . .** A method of field testing insulation of oil circuit reclosers with portable instruments and test facilities was described by R. W. Bethke and L. C. Westphal, Line Material Co. The test makes it possible to predict 60-cycle short-time dielectric strength from the 15-kv dc leakage-current values. Parts that show high leakage-current can be improved by thorough cleaning and oven drying at 85C for eight hours.

Low ohmic resistance of sound mechanical and electrical design are affective in preventing damage to a conventional oil circuit breaker when switching capacitance, said V. A. Treat, Pacific Electric Mfg Corp. The resistors reduce over-voltages to levels expected in ordinary switching, he said. Operating performance of the breaker that had been equipped with resistors in this manner has been good, said Treat.

John W. Evers, president, Commonwealth Edison Co, urged the engineering societies to consider seriously the many advantages of locating their new national headquarters building in Chicago, or the Chicago area. Evers called attention to the many service organizations and professional societies who have their national headquarters in Chicago.

Finances of AIEE are such that the institute will spend $40,000 more than its income this year and $85,000 more than its income next year, AIEE pres. A. C. Montieth reported. It appeared, said Montieth, that in order to avoid a curtailment of services a moderate increase in dues may be necessary.




Station insulators are a capital investment for a power company. How is such an investment evaluated?

This is a long-term investment. TIME is a much bigger consideration than price, since the number of dollars involved is small in the over-all picture, and the difference in price between various makes of insulators is still smaller, by virtue of competition. Therefore, the question resolves itself simply into buying the largest possible piece of the future with today's dollars.

Can it be shown, sensibly, that one insulator has any better future than another? If so, such an insulator has the highest "investment value".

You can't predict the future by laboratory test. But don't forget, today *is the "future"* of thousands of insulators bought twenty years or more ago. The performance of those old-timers is part of the records of power companies. We can't change it. On the basis of that record, new insulators are bought. Therefore, this becomes significant — a great percentage of all orders for O-B station insulators comes from past users; people who have waited for the future, kept track of it, and are now cashing-in on what they have learned.

Just remember, new insulators are at least outwardly the same. Industry Standards assure this. But, no standard deals with the future, and the value of your insulator investment is measured by *how long they stay new.* When TIME is what you're buying, you get the biggest piece of it by specifying "O-B".

**Ohio Brass**

**MANSFIELD OHIO, U.S.A.**

IN CANADA: CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT. 4421-H

LATEST LIGHT SOURCES are compared with Edison's first lamp by S. G. Hibben, Westinghouse Lamp, for speakers at the recent Interstate Power Club meeting. Left to right are John H. MacNeal, club chairman; B. J. Martin; J. O. Covington; Hibben; and J. C. Parker

## NYC Apartment Wiring 78% Inadequate

Some 78.5% of New York City apartments surveyed are inadequately wired for present loads, a Consolidated Edison Co executive told members of the Interstate Power Club, Oct. 11, at their autumn meeting in New York.

J. O. Covington, manager of Con Edison's Adequate Wiring Bureau, said further that 57.3% of those surveyed wanted one or more additional appliances, but only 7% had wiring adequate to handle them. He said the survey also showed a great many of them (32%) are restricting their appliance buying specifically because of inadequate wiring. Operating cost was revealed to be of almost negligible importance in buying appliances. Air conditioners were the most wanted of all appliances.

According to B. J. Martin, publisher, "Electrified Industry," vigorous selling requires a different approach in today's market compared with formerly used methods.

The installation of industrial television in a plant saved five watchmen on the payroll, said J. C. Parker of RCA. He said that $25,000 was saved annually in this plant by a $6,000 investment in the TV equipment.

## Engineering Shortage Put at 20,000 by Linder

American industry needs 20,000 more engineers than it can get, declared Clarence H. Linder, General Electric Cc's vice president in charge of engineering, during a brief visit in San Francisco last month.

With colleges currently producing 17,000-18,000 engineers a year, that means industry is a year behind on its supply, he said. From each new crop of college graduates GE can get only half of the technical men the firm hires each year, he said.

Best way to increase supply of engineers is to interest high school students in technical studies, he said. Linder traced the shortage of technical graduates to shortage of science and mathematics teachers in secondary schools. Salaries for teachers are too low and requirements are sometimes too rigid, he said.

Linder claimed college engineering programs could be improved with more emphasis on problem-solving, less on current engineering practices.

# MEETINGS CALENDAR

**NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION**
Region II, General Oglethorpe, Savannah, Ga., Nov. 8-9.

**NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION**
Annual Meeting, Haddon Hall Hotel, Atlantic City, N. J., Nov. 8-11.

**NATIONAL ASSOCIATION OF RAILROAD AUD UTILITIES COMMISSIONERS**
Annual Convention, La Salle Hotel, Chicago, Nov. 8-12.

**SOUTHEASTERN ELECTRIC EXCHANGE**
Accident Prevention Committee, Heidelberg Hotel, Baton Rouge, La., Nov. 11-12.

**PUBLIC INFORMATION PROGRAM**
Mid-Atlantic Region, Hotel Statler, Washington, D. C., Nov. 12.

***EDISON ELECTRIC INSTITUTE**
Industrial Power and Heating Section, Hotel Statler, Cleveland, Nov. 15-16; Industrial Relations Committee in conjunction with North Central Electric Association, Minneapolis, Minn., Nov. 18-19; Wiring and Specifications Committee, St. Louis, Nov. 29-30; Prime Movers Committee, Astor Hotel, New York, Nov. 29-30; Commercial Electric Space Heating and Air Conditioning Committee, Cleveland, Dec. 2-3; Street Lighting Committee, Boston, Dec. 7-8; Commercial Cooking and Water Heating Committee, Jefferson Hilton Hotel, St. Louis, Dec. 8-10; Industrial Relations Committee, EEI Headquarters, New York, Dec. 16; Industrial Relations Committee, EEI Headquarters, New York, Jan. 20, 1955.

**AMERICAN STANDARDS ASSOCIATION**
36th Annual Meeting and 5th National Conference on Standards, Hotel Roosevelt, New York, Nov. 15-17.

**WISCONSIN UTILITIES ASSOCIATION**
Electric-Gas Sales and Engineering Convention, Schroeder Hotel, Milwaukee, Nov. 17-19.

**NATIONAL FARM ELECTRIFICATION CONFERENCE**
1954 Meeting, Van Curler Hotel, Schenectady, N. Y., Nov. 18-19.

***PACIFIC COAST ELECTRICAL ASSOCIATION**
Joint Fall Conference of PCEA's Administrative Service Section and Accounting Section of Pacific Coast Gas Association, Sir Francis Drake Hotel, San Francisco, Nov. 18-19; Business Development Section, Hotel Californian, Fresno, Calif., Jan. 27-28, 1955.

**NEW JERSEY UTILITIES ASSOCIATION**
Annual Meeting, Seaview Country Club, Absecon, N. J., Nov. 19.

**AMERICAN SOCIETY OF MECHANICAL ENGINEERS**
Annual Meeting, Statler Hotel, New York, Nov. 28-Dec. 3.

**PUBLIC UTILITIES ADVERTISING ASSOCIATION**
Annual Meeting, Region 2, St. Moritz-on-the-Park, New York City, N. Y., Dec. 2-3.

**21ST NATIONAL POWER SHOW**
Sponsored by American Society of Mechanical Engineers, Commercial Museum, Philadelphia, Dec. 2-7.

**INTERSTATE POWER CLUB**
Meeting at Hotel Martinique, New York, Dec. 6.

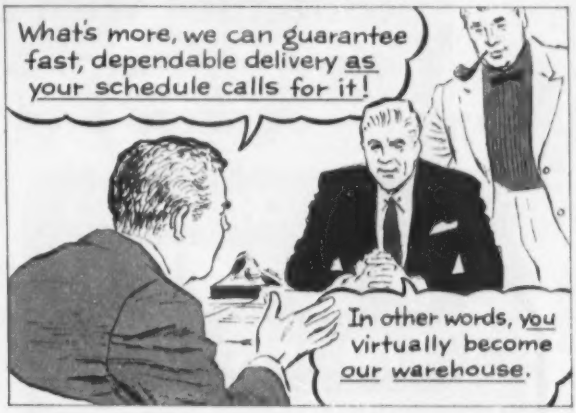
**EASTERN JOINT COMPUTER CONFERENCE-EXPOSITION**
Sponsored jointly by American Institute of Electrical Engineers, Institute of Radio Engineers, and Association for Computing Machinery; Bellevue-Stratford Hotel, Philadelphia, Dec. 8-10.

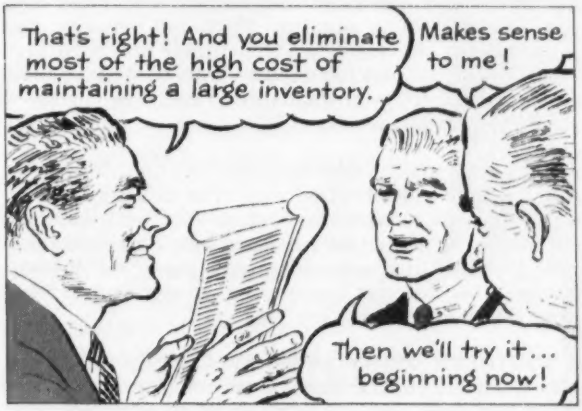
**ELECTRICAL EQUIPMENT REPRESENTATIVES ASSOCIATION**
Annual Meeting, Breakers, Palm Beach, Fla., Jan. 10-12, 1955.

**DOBLE ENGINEERING CONFERENCE**
22nd Annual Meeting, Sheraton Plaza Hotel, Boston, Jan 24-28, 1955.

*Additions this week.

You see... most of your inventory is unnecessary because... as a distributor... our warehouse is well stocked with almost every aluminum conductor item on your list.
And in a wide range of sizes and constructions, Bob!


What's more, we can guarantee fast, dependable delivery as your schedule calls for it!
In other words, you virtually become our warehouse.


That's right! And you eliminate most of the high cost of maintaining a large inventory.
Makes sense to me!
Then we'll try it... beginning now!

Why not let your Kaiser Aluminum Distributor help solve your inventory problem? A phone call will bring friendly, personal attention on any size order.

**Kaiser Aluminum Distributors Conveniently Located to Serve You:**

Line Material Co.
General Electric Supply Co.
Westinghouse Electric Supply Co.
Capital Electric Supply
Central Electric Supply Co., Inc.
Champion, Inc.
City Electric Distributors, Inc.
Corpus Christi Hardware Co., Inc.
Crescent Electric Supply Co.
Dauphin Electrical Supplies
Dutton-Lainson Co.
Electrical & Mechanical Supply Corp.
Eoff Electric Co.
Evans Electrical Supply, Inc.
Florida Electric Supply, Inc.
George H. Wahn Co.
Hampden Electric Supply Co.
Hunzicker Brothers
Interstate Electric Co. of Shreveport, Inc.
Mack Electric Supply Co.
Maydwell & Hartzell, Inc.
Nelson Electric Supply Co.
Ozark Electric Supply Co.
Russell Belden Electric Co.
S. M. Supply Co., Inc.
Southern Minnesota Supply Co.
Stuart C. Irby Co.
Stubbs Electric Co.
The Korsmeyer Co.
Virginian Electric, Inc.
Waltrip Electric Co.

**GET IN TOUCH** with your nearest Kaiser Aluminum Distributor *now*. He makes available long experience, specialized knowledge, and valuable engineering services—including the famed field and engineering services of Kaiser Aluminum. For his name, refer to the list at the left and your local telephone directory. Kaiser Aluminum & Chemical Sales, Inc. *General Sales Office*, Palmolive Bldg., Chicago 11, Ill.; *Executive Office*, Kaiser Bldg., Oakland 12, California.

**Kaiser Aluminum**

**The Nation's Largest Supplier of Aluminum Weatherproof Conductor and Triplex**

# Power

## Many utilities discover new economies with standardized designs... lower initial cost, shorter shipment, easier and faster installation

**ALLIS-CHALMERS POWER Transformers**

### Three Purchasing Case Histories Tell Actual Dollar Savings Possible

**1** **A MIDWEST UTILITY SAVED** $6,065.00 on one purchase of an Allis-Chalmers standardized unit on which it was possible to choose a different rated high voltage. For years this utility had purchased transformers with rated high voltage 66,000 delta and four 2½% full capacity taps below normal. By rating a standardized unit with high voltage of 62,700 and full capacity taps of 66,000-64,350-61,050 and 59,400 — a standardized unit was purchased at an approximate savings of 7%.

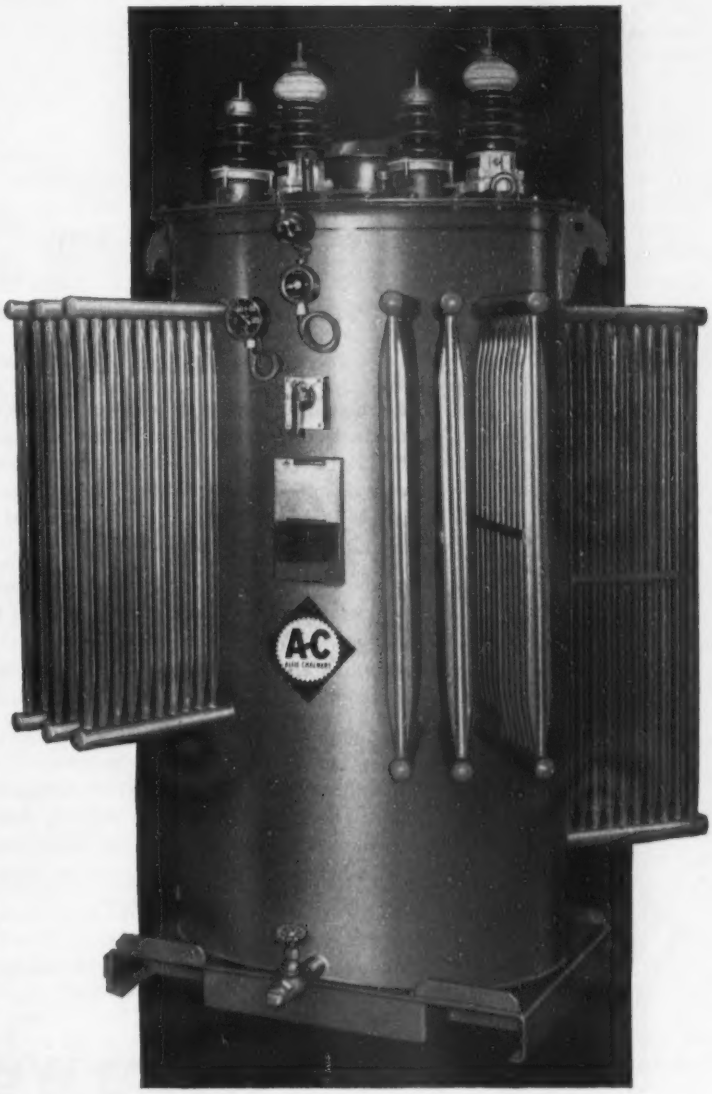
**2** **AN EASTERN STEEL COMPANY SAVED** $1,920.00 with an Allis-Chalmers standardized unit. The new transformer, high voltage 67,000 volts, low voltage 7200 volts, will operate at 6900 volts at slightly reduced kva. This makes possible operation in a bank with an existing 6900-volt transformer. This customer foresees even greater savings when more standardized units are purchased.

**3** **A SOUTHERN UTILITY SAVED** $1,557.00 by purchasing Allis-Chalmers standardized power transformers. It was found that three 1667-kva single-phase transformers rated at 13,200 voltage delta with two 2½% full capacity taps above and below normal to low voltage 2400/4160Y could be paralleled satisfactorily with existing non-standard transformers rated 1667 kva having a high voltage of 13,200 delta and taps at 12,540-12,210-11,880 to low voltage 2300/4000 wye (the transformer to be over-excited for 2400/4160 wye output).

**ALLIS-**

# Transformers

**Allis-Chalmers standardized design** power transformers offer utilities attractive savings in time and money compared to special designs. Standardization eliminates or reduces engineering and manufacturing time, results in savings up to 8% of the total cost of a transformer. Delivery can be made faster than with special transformers. Installation is simplified by standardized location of accessories. If certified drawings are required, they can be obtained immediately in many cases.




### Other Features Available

Manufactured in accordance with NEMA and ASA C57.12a Standards, these transformers are available in ratings up to 5000 kva single phase and 10,000 kva three phase. Considerable flexibility is available too. Other features include variations in primary voltages, junction boxes, different types of oil preservation, as well as other mechanical and electrical features.

It will pay to get complete details on savings made possible by Allis-Chalmers standardized transformers. Call your nearby A-C district office or write Allis-Chalmers, Milwaukee 1, Wisconsin, for more information.

A-4429

A-C ALLIS-CHALMERS

# CHALMERS

## You needn't look far

## for Honeywell instrument service

Because instruments have become such vital links in the production chain, Honeywell has developed a service organization that is the largest of its kind in the world. No matter where you may be, there's a Honeywell service man near you . . . in more than 110 service centers spotted strategically throughout the United States and Canada.

A wire or phone call to the nearest of these centers will bring help in a hurry . . . often in a matter of hours. And the service you get is expert. Honeywell men are trained, by factory schooling and field experience, in the most modern methods of keeping good instruments in peak condition.

Frequent check-ups *prevent* emergencies . . . protect your instrument investment. The economical way to do this is a Periodic Service Contract, which brings a Honeywell man to your plant at regular intervals to inspect, clean and adjust your instruments and controls. Your local Honeywell office will be glad to give you full details, and to arrange a custom-fitted contract for your requirements.

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, Wayne and Windrim Avenues, Philadelphia 44, Pa.

MINNEAPOLIS **Honeywell**

BROWN INSTRUMENTS

*First in Controls*

# PEA Group Studies Dispatcher Training

Expansion of Weather Bureau activities was foreseen by L. F. Conover, U. S. Weather Bureau, in a talk before the Pennsylvania Electric Association Systems Operating Committee meeting at Hagerstown, Md., Oct. 7-8. He cited the four-year growth of "local" weather teletype to 23 circuits today as one means by which the service can be expanded. Any utility can buy this service.

CHAIRMEN Youtz, left, introduces Vice Pres H. H. Startzman, Potomac Edison Co, and L. F. Conover, the U. S. Weather Bureau

**Training Load Dispatchers . . .** A formal training plan in three steps is used by Pennsylvania Power & Light Co to train system operators, V. O. Boland reported. The first step involves supervisory and training committee conferences with job applicants to select candidates on basis of education, aptitude, and personality. Step two continues the screening of candidates for attitudes, hobbies, and willingness to work odd hours. The screening committee further reviews records of those candidates who pass.

Candidates selected by the screening committee are admitted to a ten-week training course at system headquarters. This final step provides electrical system training in operations. Oral and written examinations check each candidate's ability and potential for further development. Graduates of this course become eligible for system operation duties and have proved capable of full shift responsibility within a few months.

**Case Problems . . .** Philadelphia Electric Co uses "Load Dispatcher Quizes," a book of more than 200 actual case problems, to help the load dispatcher develop confidence in his ability to cope with system emergencies, reported S. S. Clair. Other books used for the full time job of training a load dispatcher are a Load Dispatcher's Manual, Station Operating Handbook, and a Job Training Manual.

As a load dispatcher must analyze trouble and malfunctioning of equipment and direct switching and operation, he must have a working knowledge of theory and practice. Because of this, O. H. Nauman said, Long Island Lighting Co has recently started a 16-month training program for new load dispatchers. Trainees in this program actually perform work in the following company departments or sections: dispatching, substation maintenance and operations, relaying, construction, production, and metering.

**Use of Probability . . .** Probability analysis of errors in load forecasting indicates that spinning reserves can be minimized with safety, implied W. S. Kleinbach of the Pennsylvania-New Jersey Interconnection. Frequent readjustment of daily load forecasts permits capacity changes to meet new conditions, but voltage dropping can provide emergency relief, he said.

# System Planners Discuss Distribution Losses

Distribution losses and economics of aerial cable were key subjects discussed by the System Planning Committee of the Pennsylvania Electric Association, in Allentown, Oct. 11-12.

One way to reduce distribution losses is through use of primary capacitors to reduce the lagging current portion of the losses, said N. M. Neagle, General Electric Co. To be most beneficial on feeders with evenly distributed loads, capacitors should be located at a distance from the feeder's end equal to one half of the bank rating in percent.

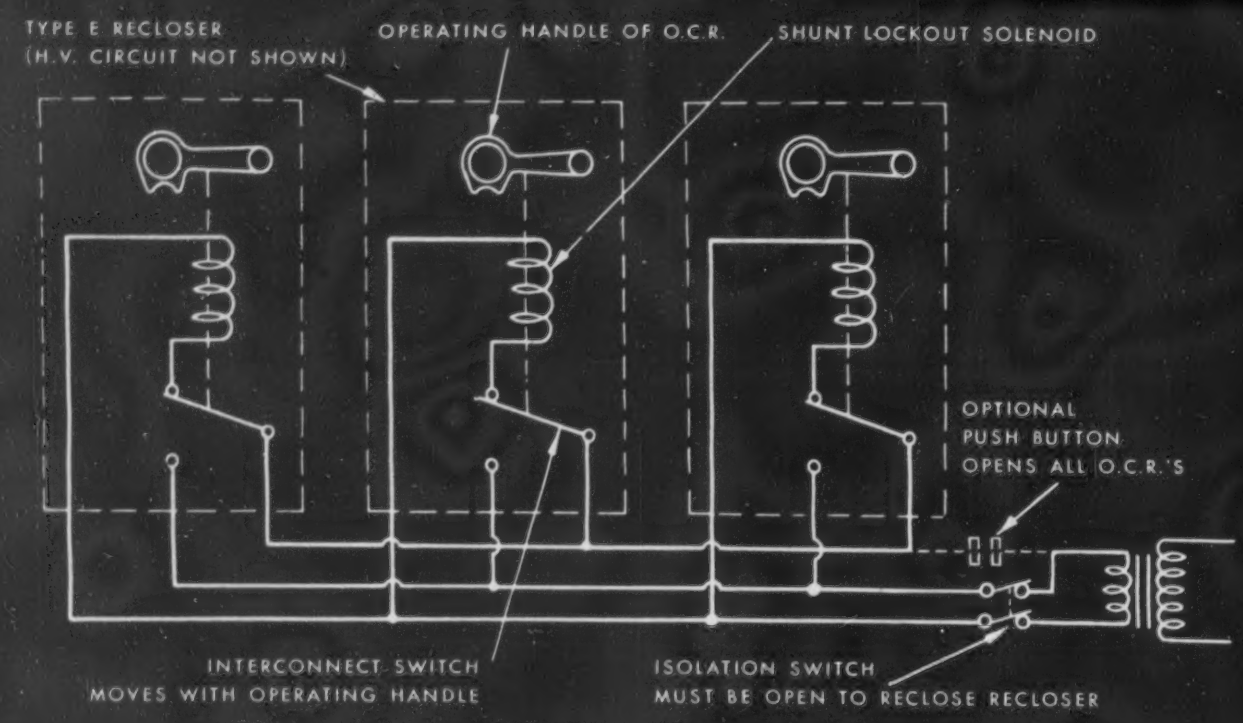
Secondary capacitors should also be considered for loss reduction even though they are more costly than primary capacitors, Neagle said. Return on investment should be the determining factor. Neagle presented an example feeder in which investment return would be greatest when the first three 20% banks are installed on the primary and the fourth 20% bank installed on the secondary.

Percent loss in primary feeder circuits is independent of load density, substation size, or number of feeder circuits for many hypothetical, equivalent geometric models of distribution-substation plans, said David N. Reps, Westinghouse Electric Corp. If system design can be maintained at some desired optimum point, system losses would also remain constant at some optimum value. This may not necessarily be the minimum value but rather one that is compatable with system economy and service quality.

These conclusions were reached from an analysis of a number of geometric distribution-substation plans for constant load density with varying voltage and for increasing load density with constant substation size and area.

F. C. Van Wormer, General Electric, extended his economic study of aerial cable from square distribution areas (EW, Feb. 22, p98) to include rectangular areas. Results show that as the feeder-to-lateral length ratio increases the cost of aerial cable also increases.

As the feeder-to-lateral length ratio is increased from one to four, the additional cost per kva for aerial cable varies from 3% to 12%. This cost, Van Wormer said, will be reduced by savings in tree trimming, less lost revenue resulting from outages caused by trees.




**Wiring diagram shows shunt lockout solenoids as applied to three Kyle Type E 23 kv reclosers. If any one phase locks out, the solenoids automatically lock out the other two phases.**

# Solenoid for Kyle® Type E Recloser Prevents Prolonged Single-Phasing

**New shunt lockout solenoid is now available on Kyle Type E reclosers to prevent prolonged single-phasing of three-phase feeder. The Type E recloser coils are rated from 5 to 100 amperes at 23 kv with high interrupting capacities of 2500 amperes at 14.4 kv, 1750 amperes at 23 kv.**

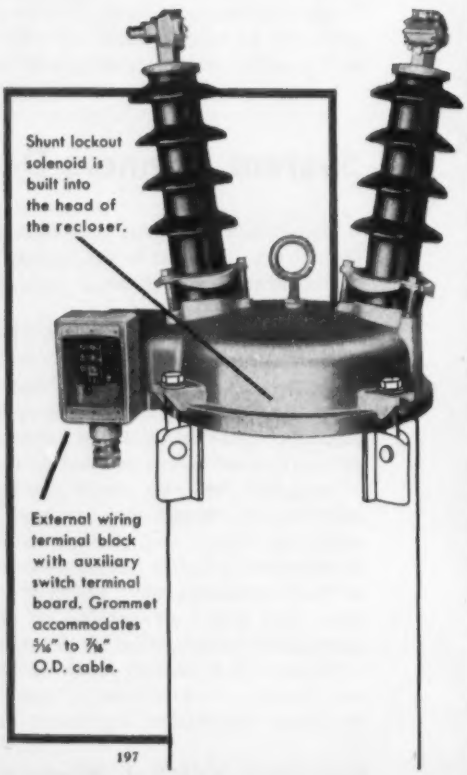
By **W. C. Wiechmann**
Application Engineer, Kyle Products Sales, Line Material Company

The shunt lockout solenoid, available on L-M's Kyle Type E recloser, is designed to trip the lockout latch and lock the recloser out. Electrical interconnection of the Type E recloser is made through the solenoid coils, thereby providing multi-phase lockout of the feeder. This multi-phase lockout will prevent a back-feed to a fault through the other phases —and eliminate prolonged single-phasing on three-phase equipment.

The shunt lockout solenoid is built into the head mechanism of the recloser. If any one phase locks out, the solenoid locks out the other two phases. The coil operates on 115 volt service and requires approximately 250 va per recloser. If an existing secondary is not available, a 1½ kva transformer is recommended. The device is an additional feature which is built in at the factory, on order.

The Kyle Type E is the only 23 kv recloser on the market. It has exceptionally strong construction and heavy insulation. The large contacts of finest arc-resisting material and the improved oil cross-blast method of arc extinction make the Type E an outstanding recloser for high-voltage application.

Get details on the Type E recloser and the multi-phase lockout, both of which have proved so successful in service. Ask the L-M Field Engineer for copy of bulletin on the Kyle Type E, or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).


Shunt lockout solenoid is built into the head of the recloser.
External wiring terminal block with auxiliary switch terminal board. Grommet accommodates 5/16" to 7/16" O.D. cable.

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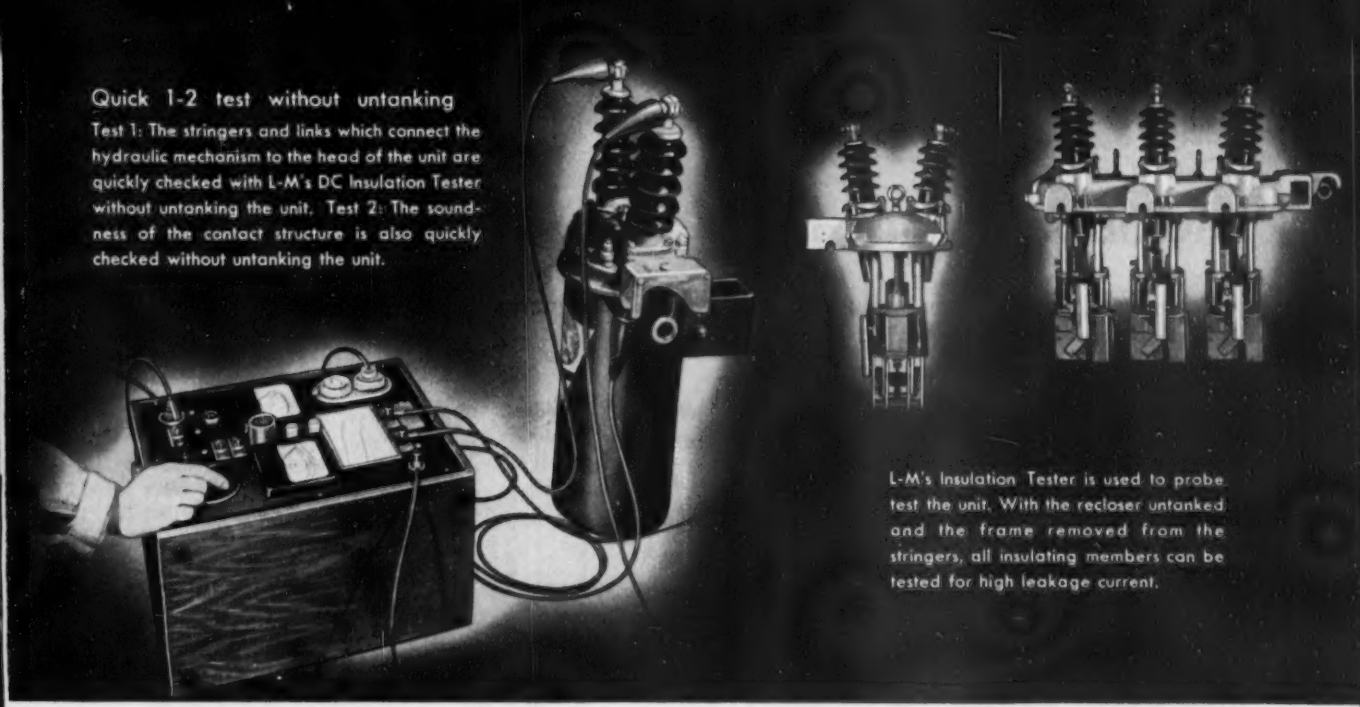
**LINE MATERIAL Kyle® Reclosers**



**Quick 1-2 test without untanking**

Test 1: The stringers and links which connect the hydraulic mechanism to the head of the unit are quickly checked with L-M's DC Insulation Tester without untanking the unit. Test 2: The soundness of the contact structure is also quickly checked without untanking the unit.

L-M's Insulation Tester is used to probe test the unit. With the recloser untanked and the frame removed from the stringers, all insulating members can be tested for high leakage current.

# Take Advantage of Longest Practical Maintenance Cycle in Kyle® Reclosers

**The maintenance cycle may be one, three, or more years, depending on climatic conditions and the duty imposed on the recloser. A method is given for determining frequency and simplifying maintenance.**

by **R. C. KIRK**
Manager
Kyle Products Sales
Line Material Company

Many Kyle reclosers are still in operation after three, four, or more years without any maintenance. To assure dependable and continued operation, such reclosers should be checked. Kyle engineers recommend a program of spot checking reclosers, to determine the longest safe maintenance cycle for your operating conditions.

The length of time a recloser can be operated without maintenance depends on several factors. Collection of moisture, for example, is a result of time, loads, and climatic conditions. The collection of carbon is, of course, a result of the operating duty, i.e., the number of arc interruptions, magnitude of the current, voltage, and power factor of the fault current. These factors, involved in determining the recloser maintenance cycle, vary with each section of the country and with the operating duty imposed on the recloser. To obtain the longest practical maintenance cycle you should organize a program that meets your individual requirements.

One means of making a quick insulation check, without disassembling the recloser, is with L-M's new DC Insulation Tester. This is a highly efficient, low-priced portable unit that accurately determines the condition of insulation in reclosers and other apparatus.

If you find it necessary to replace the contacts on the recloser, it is advisable to replace the complete contact assembly, because this insures obtaining the proper setting of the contacts without calibration equipment. L-M makes available a complete contact assembly which is pre-adjusted at the factory and very easy to install. All the insulation parts as well as the contact assembly are shipped in a sealed plastic bag so that they will be protected from moisture in handling and storage.

### Get The Facts On Maintenance

The L-M Field Engineer can help you with your maintenance problems. Discuss them with him—you'll find his advice helpful. Detailed maintenance instruction bulletins are available for Kyle reclosers, switches and sectionalizers. A bulletin that discusses factors determining the frequency of maintenance periods and how maintenance should be done is also available. Ask your L-M Field Engineer for these bulletins or write Kyle Products Division, Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).

Coils are vacuum-impregnated and shipped in oil-filled, sealed cans. L-M reclosers are so constructed that coils of different ampere ratings are interchangeable.

Other insulation parts as well as the contact assembly are shipped in sealed plastic bags to protect against moisture and dirt.

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**LINE MATERIAL Kyle® Reclosers**

# McKibben Made Executive VP

**Newly elevated Green Mountain Power official formerly served as vice president. Baker assumes new operating post**

GLEN M. McKIBBEN

Glen M. McKibben, vice president of Green Mountain Power Corp, Burlington, Vt., has been promoted to executive vice president. The utility also advanced John H. Baker from manager of operations to the executive post of operating vice president.

McKibben joined Green Mountain Power last June as vice president (EW, June 28, p 164). Prior to this he was associated with Stone & Webster Service Corp.

**Former Stone & Webster Official . . .** He was graduated from Oregon State College in 1935 with an electrical engineering degree. Until 1940 he served in the engineering department of West Coast Power Co, Portland. Then, except for three years as general manager of Walden (N. Y.) Telephone Co, he worked with Stone & Webster Service, serving in various engineering and executive posts in the New York and Boston offices.

Baker has been with Green Mountain for 27 years, filling various supervisory and managerial posts. Baker, who was employed at one time with the Burlington (Vt.) Electric Light Department, is a past president of the Vermont Electrical Association.

# Monongahela Sales, Operating Changes

Changes designed to expand its general sales program and strengthen operating functions have been revealed by Monongahela Power Co.

The revamping calls for Vice Pres Don B. Potter to move up to the post of administrative vice president.

In assuming new responsibilities in both sales and operations, Vice Pres Eric C. Summers relinquished his additional title of comptroller and Arnold L. Adams, assistant comptroller, advanced to comptroller.

Paul H. Sommer, veteran division manager, was transferred to headquarters as assistant to Vice President Summers. His work will be primarily connected with co-ordination of division activities. Ellis Vest, special representative, was named to replace Sommer as manager of the Morgantown (W. Va.) Division.

Other major changes include appointment of G. W. Harr as manager of general services, a new title. Harr's assistant is W. P. Roberts, office manager on recent plant construction projects. W. C. Wade, Fairmont Division manager, was assigned to the new position of manager of retail sales, and J. S. Crooks, manager of operations, had his title expanded to manager of transmission and distribution.

•

**W. D. Ligon** has been appointed manager of Westinghouse Electric Corp's Lighting Division plant at Vicksburg, Miss. He replaces **D. E. Jenkins** who has been transferred to the staff of the division manager at Cleveland, Ohio. The new Vicksburg manager, who joined Westinghouse in 1929, comes from the Westinghouse Sunnyvale, Calif., plant, where he was project manager in charge of building giant compressors for the Air Force's wind tunnels at Tullahoma, Tenn. A veteran of nearly 20 years with Westinghouse, Jenkins has served as manager of the company's Vicksburg plant since 1952.

**George W. Douglas** has been appointed manager of lighting sales in the specialty products department in the Corning Glass Works. He succeeds Arthur S. Tylor, who will take over the firm's San Francisco lighting sales office. Associated with Corning Glass Works since 1944, Douglas has served at the Corning, N. Y., office for over a year after working in Corning's Philadelphia and New York district sales offices.

**Leo A. Mayo,** director of methods for Connecticut Light & Power Co, has been elected comptroller of the utility. In another appointment, **Traver L. Berry,** a New Jersey certified public accountant, was appointed assistant comptroller. Mayo joined Connecticut L&P in 1929, assuming the director's post in 1951.

**Nicholas C. Jessen** has been made assistant superintendent of the Barberton, Ohio, works of Babcock & Wilcox Co's Boiler Division. During the past two years Jessen has had two assignments in Europe where he observed heavy forging practice, steel production, welding and boiler fabrication methods. He joined Babcock & Wilcox in 1930.

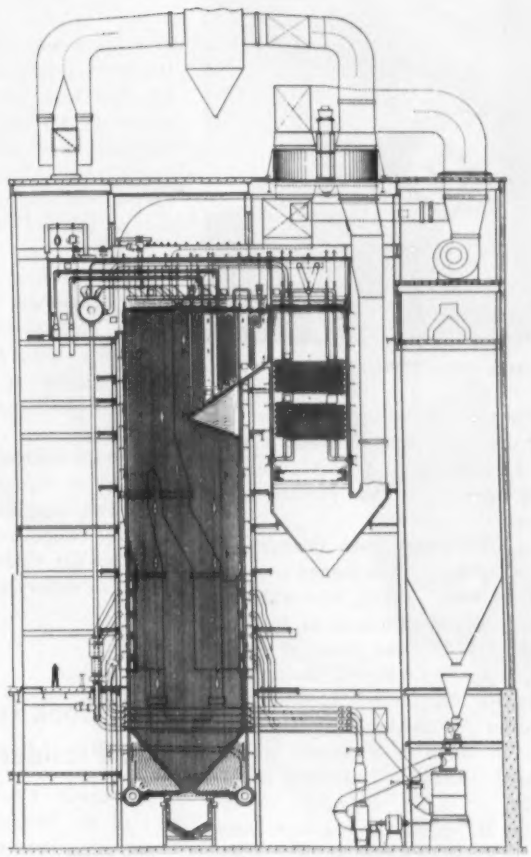
## New RCA Vice President

John W. Craig has been elected vice president and general manager of the RCA Victor Home Appliance Division of Radio Corp of America. In his new post, Craig will supervise the activities of the RCA Estate Appliance Corp and the RCA Air Conditioning Department. Since April, 1953, he has served as president, chief executive officer, and a director of Aluminum Industries, Inc. Previously he was vice president of Avco Manufacturing Corp and general manager of its Crosley Division.

# DAN RIVER STATION

**Duke Power Company**

# C-E controlled circulation boilers



The C-E Unit shown above is now in process of construction for the Dan River Station of the Duke Power Company, near Spray, North Carolina.

This unit is designed to serve a 150,000 kw turbine-generator operating at a throttle pressure of 1800 psi with a primary steam temperature of 1000 F, reheated to 1000 F.

This unit is of the controlled-circulation, radiant type with a reheater section located between the primary and secondary superheater surfaces. An economizer section follows the rear superheater section and regenerative type air heaters follow the economizer surface.

Pulverized coal firing is employed, using bowl mills and tilting, tangential burners.

B-795

**COMBUSTION ENGINEERING, INC.**

Combustion Engineering Building
200 Madison Avenue, New York 16, N. Y.

BOILERS, FUEL BURNING & RELATED EQUIPMENT; PULVERIZERS, AIR SEPARATORS & FLASH DRYING SYSTEMS; PRESSURE VESSELS; AUTOMATIC WATER HEATERS; SOIL PIPE

# B.C. Electric Elevates Ingledow

**Vancouver utility official becomes vice president and executive engineer. Purdy is named to executive vice presidency**

THOMAS INGLEDOW

Thomas Ingledow, vice president and chief engineer of British Columbia Electric Co, Ltd, Vancouver, has been appointed vice president and executive engineer.

In other top level changes, Dr Harry L. Purdy was named executive vice president. Purdy, who was made vice president and head of the company's Gas Division about 17 months ago, now also takes over the responsibility for the utility's General Sales Division and industrial relations subdivision. John R. P. Powell was appointed executive assistant to Dr Purdy.

Jack H. Steele, who has been executive assistant to Ingledow for the past nine years, has been named chief engineer. Ingledow has been in charge of most of the utility's postwar construction.

DR HARRY L. PURDY

•

**J. A. Bordelon,** assistant to the comptroller of Houston Lighting & Power Co, has been elected secretary and treasurer to succeed the late Martin B. Pigott (EW, Oct. 4, p 164). Bordelon entered the employ of Houston L&P in 1943, advancing to the present post in January of this year.

**Bernard Swift,** superintendent of the Tirex department of Simplex Wire & Cable Co, Cambridge, Mass., has been appointed project engineer in the company's engineering department to specialize in development work.

**C. Howard Brittenham,** formerly plant manager of Square D Co's plant at Peru, Ind., has been appointed plant manager of the Iowa National Manufacturing Co, Cedar Rapids, a wholly owned subsidiary of Square D.

## H. E. Cook Is Elected New President of IAEL

Herbert E. Cook, executive secretary of the Electrical Association of Detroit, has been elected president of the International Association of Electrical Leagues. Cook, formerly vice president of the organization, succeeds Albert L. Maillard of the Electric League of Indianapolis.

IAEL's other newly elected officers include: Vice president, E. J. McGinnis, business manager, Cincinnati Electrical Association; treasurer, D. E. Rosenthal, managing director, Nebraska-Iowa Electrical Council; and secretary, G. L. Logan, managing director, Electric League of Los Angeles.

Cook became affiliated with the Detroit association in 1949. Before this he was with General Electric Co at Harrison, N. J., and San Francisco, and Detroit Edison Co's Lighting Sales and Customer Service Division.

V. CRAIG RICHTER

## Craig Richter Named EW Associate Editor

V. Craig Richter has joined the staff of Electrical World as an associate editor. Since early in 1952 he has been an editor of "Utility Spotlight" and of "Chemical Spotlight," an associated publication.

Richter started his journalism career in the Johannesburg, South Africa, bureau of Reuters News Agency in 1936. A year later he became a reporter for a local paper.

He made his first industrial contacts in 1941 when he went to Washington to become a division head with the South African Government Supply Mission. As a purchasing agent he gained considerable understanding of industrial activities throughout the United States.

In 1946 Richter returned to news work as desk editor for Reuters in its New York office. He left in 1952 to join "Utility Spotlight" for which he had been doing part-time work.

For the past six years he has been doing articles on U. S. industrial activities for a South African publication.

He is a graduate of the Columbia School of Journalism.

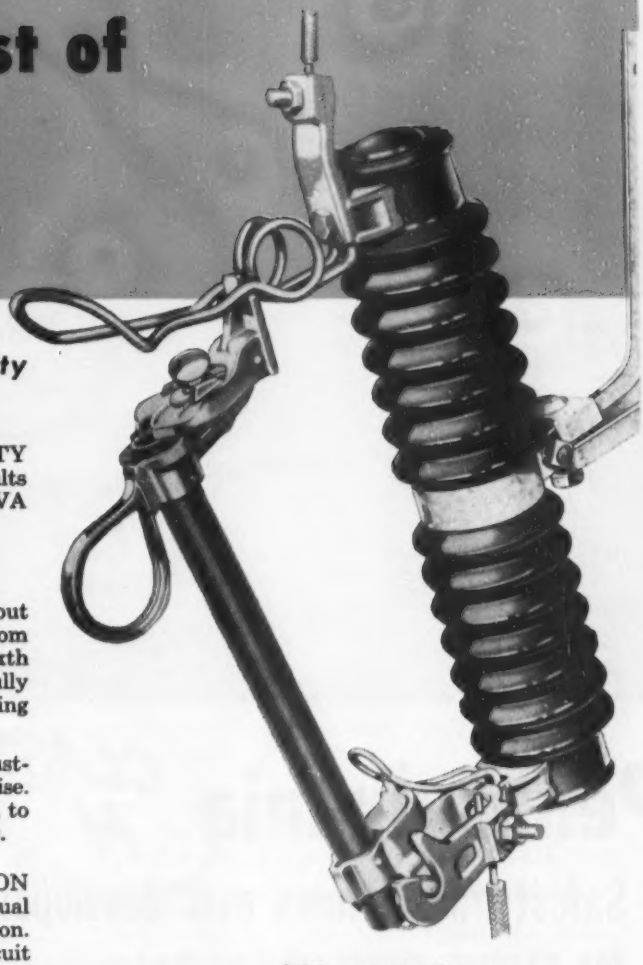
## OBITUARY

**Vincent A. Sommar,** 62, secretary of the Philadelphia Electric Co, died Oct. 14 at Philadelphia. He joined Philadelphia Electric in 1928, serving for the last 17 years as secretary. Previously he was the president's aide.

# More PROOF !

## QUALITY CUTOUTS PAY OFF IN LOWER MAINTENANCE

## Actual Field Test of KEARNEY H-D TRIP-OUT



***Demonstrates High Short Circuit Interrupting Capacity***

**TEST:**

A standard, 100 ampere, 15 KV HEAVY DUTY TRIP-OUT* (16234-3) was subjected to faults made on the 15 KV side of a 10,000 KVA transformer.

**RESULTS:**

At 14.4 KV with a 20% power factor, the cutout successfully interrupted six shots ranging from 7620 to 8750 amperes, RMS. After the sixth shot, the cartridge and contacts were carefully examined and found to be in perfect working condition.

After the short circuit test, without any adjustment, the cutout was tested for temperature rise. The maximum found was 13°C, as compared to the 30°C allowed by NEMA on new cutouts.

**NOTE:** These reports are NOT BASED ON CALCULATION! They are the results of actual field tests at Kearney's 34.5 KV substation. Power was taken from the Union Electric circuit providing a 445,000 KVA backup.

**Taken at random from the regular production line.*

JAMES R. KEARNEY CORPORATION ST. LOUIS, MO. GUELPH, ONT.

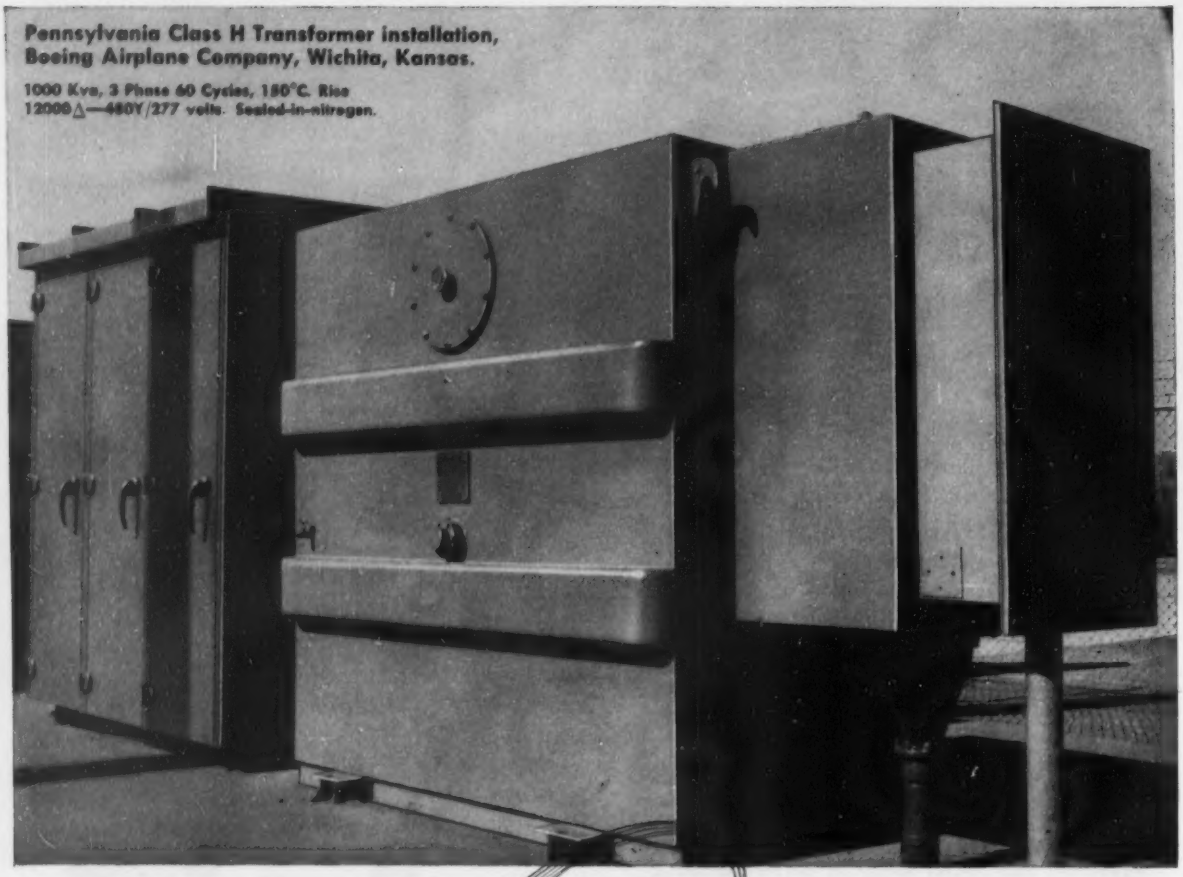
*The Mark of Quality Products*

Kearney high-quality cutouts cost you less in the long run. Built to last, they have such engineered refinements as: auxiliary spring contacts for added trip-out torque, heavy fuse tubes lined with horn fibre, and cast bronze operating parts. These and other Kearney quality features are your assurance of more economical, safer and longer-lasting protection for your distribution circuits. Ask your Kearney Representative to show you the Trip-Out engineered for your load and fault conditions.

**JAMES R. KEARNEY CORPORATION**
4224-42 Clayton Ave. • St. Louis 10, Missouri
*Canadian Plant: Guelph, Ontario*

## Specify KEARNEY Products

*For Better Construction . . . For Safer Maintenance*



Pennsylvania Class H Transformer installation,
Boeing Airplane Company, Wichita, Kansas.

1000 Kva, 3 Phase 60 Cycles, 150°C. Rise
12000 Δ—480Y/277 volts. Sealed-in-nitrogen.

# Pennsylvania CLASS H Transformers

## Safest transformers ever developed for UNIT SUBSTATIONS NETWORK SYSTEMS GENERATING STATIONS available in the following ratings:

| | KVA | VOLTAGE |
|---|---|---|
| VENTILATED | UP TO 3000 | UP TO 15 KV |
| SEALED IN NITROGEN | UP TO 2000 | UP TO 15 KV |

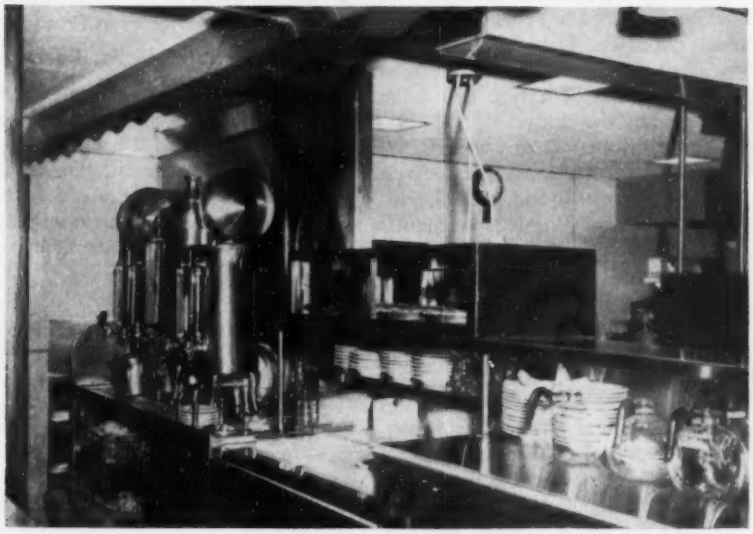
### Consider these Advantages:

- No fire or explosion hazards
- Lowest fire insurance rates of any transformer
- Transformer least affected by water
- Exceptionally high overload capacities
- Requires minimum maintenance — even in contaminated areas

For further information on Pennsylvania Class H transformers, we invite you to write to Pennsylvania Transformer Company, Box 330, Canonsburg, Pa., and ask for your free copy of Bulletin 951 — "H . . . in a Class by itself."

**PENNSYLVANIA TRANSFORMER COMPANY**

*A McGraw Electric Company Division* • **CANONSBURG, PENNSYLVANIA** • *Greater Pittsburgh District*



**SALES DOUBLED** when 1-kw pie-warmer (center) was installed to keep apple pie hot and fresh. Orders are placed on pass-over shelf (right) where overhead lamps keep food warm.

# Electric Kitchen Scores 3 Ways

Things are in apple pie order on three counts at Andy's Diner in Seattle now that it is equipped with an all-electric kitchen.

First, apple pie sales there have doubled. Customers get oven fresh pies at any time of the day since installation of a 1-kw infrared pie warmer.

Second, the owner likes electric cooking's economy plus the fact that his all-electric production line helps him get a faster customer turnover—three per seat during rush lunch periods.

Third, employees like its cleanliness.

Customers also are attracted to the "before your eyes baking" which is carried on in the kitchen located between the two dining area. Another big hit with employees is the way ranges, coolers and other large units are mounted on casters to simplify cleaning of hard to reach corners. This also makes rearrangement easy when new equipment is added.

It is all these things, particularly cleanliness and economy, that caused Andy's owner-manager to switch to electric cooking. "Another employee at $10 per day would be needed," he says, "just to do the extra cleaning if gas were used." Monthly electrical bill for the 80-kw total connected load averages 1% of total operating costs.

Largest items among Andy's $10,000 worth of electrical equipment are two ranges, complete with six griddles and two thermostatically-controlled 43.8-kw commercial ovens for pie-baking and roasting. Other items besides the pie-warmer include: two 15-kw hot water tanks, 12.2-kw coffee service, 5-kw potato steamer, 1.6-kw soup warmer, 1.5-kw silver rinse and electric food choppers and slicers.

And that isn't all. Electricity is used for space heating, too. An air conditioning unit equipped with 20 kw of heating elements is the principal heat source. Supplementary heat is provided by an electric strip heater along the lower wall in one of the dining areas.

## Builders Feature Wiring

That Sacramento's leading builders recognize the need for adequate wiring was shown at a recent Parade of Homes sponsored by the Associated Home Builders of Sacramento.

All but one of the 26 model homes exhibited had a 100 amp or larger service entrance. Twenty won Adequate Wiring Certificates and 19 featured electric ranges—13 of them the built-in type. Nearly a third of the homes were air conditioned and one was equipped with a heat pump to make it 100% all-electric.

## Quota Busters Drive Makes 433% of Goal

"Sell new load that will produce kwhr's and revenue immediately—sell anything that will add year-round load." With this challenge the district managers and commercial and industrial representatives of Idaho Power Co began their "Quota Busters" campaign. The salesmen were charged with selling 1,250 kw of new small commercial and industrial load to bring in $25,000 of additional revenue.

But quotas were forgotten as the utility salesmen sold over 5,400 kw of new load—433% of the original quota—in the two-month drive recently concluded.

One manager led his district to a smashing 1,535% of its assigned quota. Two others exceeded theirs by 1,488% and 1,328% respectively. Among individual representatives, the top man went over the top by 504%, the second by 472%. High district manager and representative each received trips to out-of-town business conferences. Second and third prizes also were awarded.

New load added during the campaign included commercial electric cooking and water heating, and several types of indoor and outdoor lighting.

## PP&L's "Heat's On" Drive Gets Red Hot Results

A three-month "Heat's On" industrial electric heating campaign has paid off handsomely for Pennsylvania Power & Light Co. The results: 254 jobs sold; 4,778 kw connected; $220,995 added in estimated annual revenues.

Purpose of the campaign was to get more of all types of electric heating applications into plants and mills in PP&L's highly industrialized service area. Six of the company's seven divisions and nearly half of the 28 representatives topped their quotas. Two men attained over 400% of their quotas. At campaign's end "Hot" team members (those who reached or bettered their quotas) sat down to a steak dinner. Members of the "Cold" team ate crow.

PP&L considers the "Heat's On" effort to be one of its best to date.

## More Wiring Finance: WWP and Kansas City

Wiring finance plans have been put into action by still two more industry organizations — Washington Water Power Co and the Electric Association of Kansas City (Mo.).

Both plans follow much the same pattern as others that are now in operation across the country. WWP's financing is handled through the company itself. Kansas City's is financed by a local firm although customers make payments each month on their Kansas City Power & Light Co bills.

Kinsey M. Robinson, WWP president, has called his company's new program "a war against obsolescence. With this program there are no more worries when you have a live prospect who's afraid he can't afford wiring."

The Kansas City League plans to spend $40,000 for promotion to put over its wiring plan during the next 11 months.

Promotion includes regular Sunday newspaper ads and 575 one min radio and TV spots between now and next September. A brochure with a postage-paid return card is being sent all leads turned up by the advertising. Postcards returned are given electrical contractors on a rotating basis. A kit containing promotional materials and forms has been distributed to contractors. Entitled ". . . Here's How You Can Turn Copper Into Gold," it urges them to aggressively sell better wiring by translating its benefits into terms of customer comfort, safety and convenience.

## Philadelphia Offers Free Electric Range Installation

Greater electric range sales are expected by the Electric Association of Philadelphia with a free installation plan it is making available until Nov. 30 to Philadelphia Electric Co customers.

Cooperating dealers and distributors assume cost ($22.50) of providing an electric range circuit (from service entrance cabinet to range) to eligible customers who purchase a range and desire installation during the campaign period. Philadelphia Electric, where necessary, installs adequate service entrance facilities free of charge. To qualify, a customer must occupy a single-family residence not previously wired for range service. Also, he must not be connected to Philadelphia Electric's gas mains. Only new ranges are qualified in the plan, and they must be current models of a type and make approved by the utility.

The plan operates this way:

When a participating dealer sells an approved range to an eligible customer, he sends installation request form including a consent release and waiver signed by the customer to Philadelphia Electric. Duplicate and triplicate forms go to the distributor supplying the dealer. The utility, upon receiving the form, visits the customer's home, prepares job specifications, obtains bids and informs the dealer. Dealer then advises distributor that he accepts his portion of the installation cost and distributor forwards full payment to the utility. Utility then authorizes the selected contractor to proceed with the job. Dealer delivers the range upon the utility's request. Contractors who want to participate in the installation work must register and qualify with Philadelphia Electric.

Association also is conducting a Diamond Jubilee electric clothes dryer promotion concurrently with the range activity.

## S & S Shorts

### One Demonstration Sells 100 kw

More than 100 kw in commercial electric cooking equipment has been sold so far as a result of one fry kettle, range and griddle demonstration staged recently in the Carolina Power & Light Co territory. A gas versus electricity demonstration proceeded the show.

### Lives Up to Its Name

West Penn Power Co's "Electrified Farming" magazine makes heavy use of pictures in its latest issue to tell stories of poultry house and stable ventilation, electric barn cleaning and silo unloading. The snappy, well-edited publication is mailed bi-monthly to farmers in the West Penn service area.

### Gifts Get Push

The heavy fall and Christmas buying seasons will see a continued promotional push of electric housewares reports NEMA's Electrical Housewares Section. The industry is urged to cash in and to make use of slogan, "Electric Housewares . . . First Gift Choice."

Smithcraft Lighting Division

## Something Special in Luggage Lighting

Enhancement of merchandise sales appeal was the aim of Larry Sweetland, New York State Electric & Gas Corp, in his design of lighting for Carey's, a luggage store in Elmira. He achieved this by using two glass panel assemblies for general illumination plus down lights over counters and accent displays. The general maintained level of lighting is approximately 100 ft-c.

even in
an age of speed...
sheer velocity is not
always an asset...

...in fact
there are some
instances...

...where it's
a real
liability!

take low disc speed in a meter . . .

Speed is definitely not an asset in the turning rate of a watt-hour meter disk.

That's why the disk in the Sangamo J2 Watthour Meter revolves at a low, low rate of speed—only 10 revolutions per minute at the nameplate rating of 15 amperes. And only 66⅔ revolutions per minute or approximately one revolution a second when the J2 is busy measuring a full load of 100 amperes. Yet the J2 has exceptionally high driving power.

This means the Sangamo J2 lasts longer and requires less maintenance than ordinary meters . . . there's less wear on all moving parts.

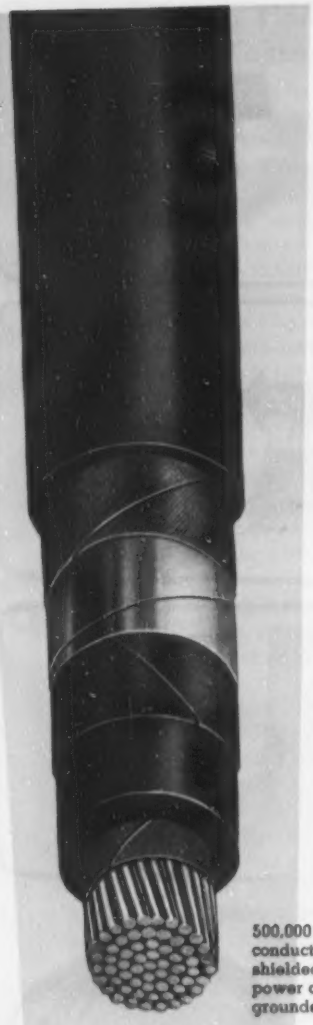
It means good public relations, too. Mr. Customer doesn't like to see his meter spin.

*A METER WITH STRAIGHT LINE ACCURACY*

*UP TO 100 AMPERES*

**SANGAMO**
ELECTRIC COMPANY
SPRINGFIELD, ILLINOIS

JM54-10



500,000 CM stranded single conductor RoZone insulated, shielded, RoPrene sheathed power cable . . . 15,000 volts, grounded neutral.

# Rome RoZone®

## This Superior Ozone-Resistant Insulation Deserves Your CONFIDENCE

**Q:** WHAT IS ROZONE?

**A:** A PREMIUM quality, ozone-resistant, oil-base type insulation developed by Rome Cable research, exceeding *all* requirements of ASTM specification D-574. RoZone is exceptionally resistant to corona action and aging. It shows high electrical stability in water and possesses excellent electrical characteristics. While the preferred outer covering on non-shielded cables is a RoPrene (Neoprene) sheath, RoZone insulation can be supplied with either braided or lead sheath coverings. In addition, on shielded types of cable, a special thermoplastic sheath (ROSEAL) is available.

**Q:** WHERE IS ROZONE USED?

**A:** Rozone is recommended for all specialized or general purpose wiring where long-time dependability is paramount. It is particularly suitable for higher voltages up to 15 KV. With proper sheath protection, RoZone is widely used for high voltage underground and aerial power distribution, street lighting circuits, signal and control cables, as well as for low-voltage power requirements where conditions of moisture or heat are present.

**Q:** WHAT DO ROZONE TESTS SHOW?

**A:**
1. High resistance to aging. Longevity of original characteristics.
2. On the basis of long-time test, dielectric strength exceeding 400 volts per mil, for 5,000 volt services. Surge or impulse strength proportionately high.
3. Utmost resistance to corona and ozone cutting.
4. Low dielectric loss.
5. Exceptional electrical stability in water.

The Rome Power and Control Cable Catalog contains complete information on Rome RoZone. Send for your copy today!

***It Costs Less To Buy the Best***

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*and*
TORRANCE · CALIFORNIA

ROME CABLE ROME, N.Y.

# More EE's Needed By Western Utilities

Western electric utilities are in danger of running short of electrical engineers unless they can recruit more college students to choose careers in power.

The growing need for electrical engineers is reported in the October issue of "Electrical West," a McGraw-Hill publication. To get a complete picture of the manpower situation, the magazine questioned 15 major electric utilities and 15 western colleges. Utilities participating in the survey represent well over 85% of the generating capacity in the 11 western states.

**More EE's Needed by 1960 . . .** Eight firms say they have enough electrical engineers right now, but seven could use more. All companies that were able to project their needs report that they will employ "substantially more" electrical engineers by 1960. The number in western utilities doubled in the 1940's; in 1960 will be three times what it was in 1940.

The complete survey showed one electrical engineer is required for every 7,500 kw of generating capacity. There are probably about 2,530 employed by western utilities now; by 1960, at least 3,300 will be needed; or even 4,000, if the 7,500-kw yardstick is maintained.

Keeping pace with utility system growth, the West will be able to absorb a minimum of 120 new electrical engineers every year, plus another 35 to 40 to replace those who will retire. Where these 160 engineers are to come from is a question neither the utilities nor the colleges can answer.

**Only 18% Chose 'Power Option' . . .** Although western schools turned out 382 electrical engineers this year, only 18% chose the "power option." If an average of 600 are graduated every year between now and 1960, as estimated by the universities, and the same percentage is available to utilities, they still will get only 108 men annually.

Students are not looking to the utilities but to other branches of engineering. Colleges report 50% are most interested in electronics and radio branches of electrical engineering, 32% in mechanical engineering, and 12% in electrical engineering. Only about 6% favor civil engineering.

**Recruit Engineers . . .** Most utilities say they visit colleges to recruit engineers, but some schools report such programs on their campuses are negligible.

In general, appeals used by recruiting utilities are similar to those which colleges believe will be most effective. Utilities point to opportunity for advancement within their own organizations as the most attractive inducement (See table).

According to colleges, students are most apt to be lured by opportunity and pay. Security and fringe benefits are not important to young job seekers, but they are eager for the chance to learn more either on the job or by taking advanced courses.

**Pay Scale . . .** Starting pay for electrical engineers in western utilities ranges from $3,410 to $5,810, average is from $4,033 to $4,878, mean is $3,960 to $4,860. In upper range the spread is from $4,200 to $11,800, average for these senior brackets is from $6,712 to $8,813, mean of this group is from 5,040 to $8,500. Every reporting company offers benefits such as vacations, insurance, and pensions.

Results of the survey, "Electrical West" pointed out, indicate utilities might broaden their recruiting programs, emphasizing the factors most likely to appeal to EE's; urge students to major in engineering; and increase on-the-job training opportunities.

### Utilities Think These Are Top Inducements . . .

| | |
|---|---|
| Opportunity for advancement within company | 7* |
| Security and stability | 6 |
| Good salaries | 4 |
| Good working conditions | 4 |
| Fringe benefits | 4 |
| Location and climate | 4 |

### But Colleges Say This Is What Attracts EE Graduates

| | |
|---|---|
| Opportunity, plus interesting work | 8** |
| Salary | 7 |
| Location | 4 |
| Additional training | 3 |
| Past and future performance of business | 3 |

* Number of electric companies. ** Number of colleges.

## INDUSTRIAL RELATIONS BRIEFS

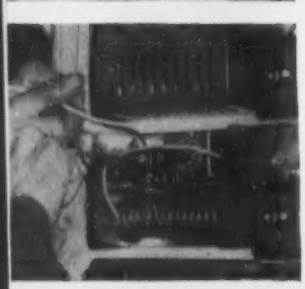
**Resolution** advocating a Wisconsin "right to work" law, prohibiting the closed shop and other forms of compulsory unionism, has been adopted by the Wisconsin State Chamber of Commerce at its annual meeting in Madison. Other resolutions included one urging that the scope of federal authority in labor relations should be reduced so that whatever authority is required shall be exercised at state and community levels.

**Oklahoma State Legislature Council's** labor and industry committee has refused to consider a proposed state "right to work" law.

**Professional Engineers** Conference Board for Industry in cooperation with the National Society of Professional Engineers has launched a nation-wide survey of training programs for young engineers in industry. John D. Coleman, engineering executive for the General Motors Corp and chairman of the Conference Board, will direct the project. Results of the survey will be published in a report late this fall.

*All industry hands join in Minnesota to . . .*

# *Re-Wire A Farm in One Day*



One morning early last month, a corps of 46 electricians moved onto a Minnesota farmstead, unpacked their tools, and set to work.

Fast behind them came a crowd of 3,000 persons to watch. What they saw was "Wire-rama": a demonstration of how an entire farm can be rewired to modern standards in a single day.

Scene of the show was the Elmer Busch farm on Route 2 near Shakopee, Minn. Throughout the day the electricians, all donating their time, worked against the clock to get the wiring in by nightfall. The crowds of onlookers were kept busy too, watching wiring demonstrations and asking questions. A high school band played. At noon, Cedric Adams, well-known Midwestern newspaper columnist, did his radio broadcast from the farm.

**Statewide Sponsorship . . .** "Wire-rama" was the brain-child of the North Central Electrical League and Radio Station WCCO. Contributing were various other Minnesota farm, electrical and educational groups. In all, 65 persons on 14 state-wide committees had a hand in it. "Idea," said the sponsors, was "to show how a farm wiring system, installed years ago, can be modernized to meet present and future needs with safety, convenience, and economy."

Busch's farm makes use of a large variety of electric equipment including milk coolers, barn cleaners, a hay hoist, and a hydraulic unloader he invented himself. His home has an electric range, two water heaters, freezer, clothes dryer, washer, and many smaller appliances. Electricity (his farm uses some 1,500 kwhr per month) is supplied by the Minnesota Valley Electric Co-operative, which in turn is served by Northern States Power Co.

The farm's new wiring system followed a plan developed by "Wire-rama's" design committee. One idea carried out was to calculate voltage drop in terms of various system parts, rather than to create a minimum overall voltage drop. The system, served from a 10-kva transformer, was divided into four segments: the line from the transformer to the service pole, the line on the service pole, the yard feeders, the circuits in the farm buildings. Maximum voltage drop allowed to all but the service pole or meter loop is less than 1%. The service pole is held to less than ½ of 1% making the total voltage drop for the entire farm system less than 3½%.

**Underground Feeders . . .** Feeder circuits were placed underground in 24-in-deep trenches. They include three single circuits each to the house, the hay hoist, the pump, and the upper part of the farm. Six more circuits in two separate feeders of 100-amp capacity supply the barn. Wires for control circuits also were buried.

Everywhere, from hayloft to fruit cellar, circuits were made large enough to handle future as well as present needs. No. 1 wire was used in feeder circuits; No. 12 wire in the house. Remote control switches were provided for yard lights; three-prong outlets for all barn and much of the house equipment.

When nightfall came, the Busch's had a completely up-to-date wiring system, and farmers from miles around (at least "Wire-rama's" sponsors hoped so) had a better idea of what it takes to operate a farm electrically.

Among those aiding the league and WCCO were: University of Minnesota, two electric cooperatives, Northern States Power, Board of Electricity, electrical inspectors and manufacturers, bankers, fire underwriters, and vocational agriculture instructors.

"WIRE-RAMA" SPECTATORS were shown materials used to modernize the farm's wiring

100-AMP SERVICE entrance was installed in Farmer Busch's 65-year-old home. Extra circuits were put in for the water heaters, dryer, etc

MAIN LINE CABINET, next to meter pole, controls six feeders—three 100-amp, two 70-amp and one 30-amp—plus an extra lighting circuit

WIRING DEMONSTRATION (above), staged by Andrew Hustrulid of University of Minnesota's Ag Engineering department, pointed out farm re-wiring needs for "Wire-rama's visitors

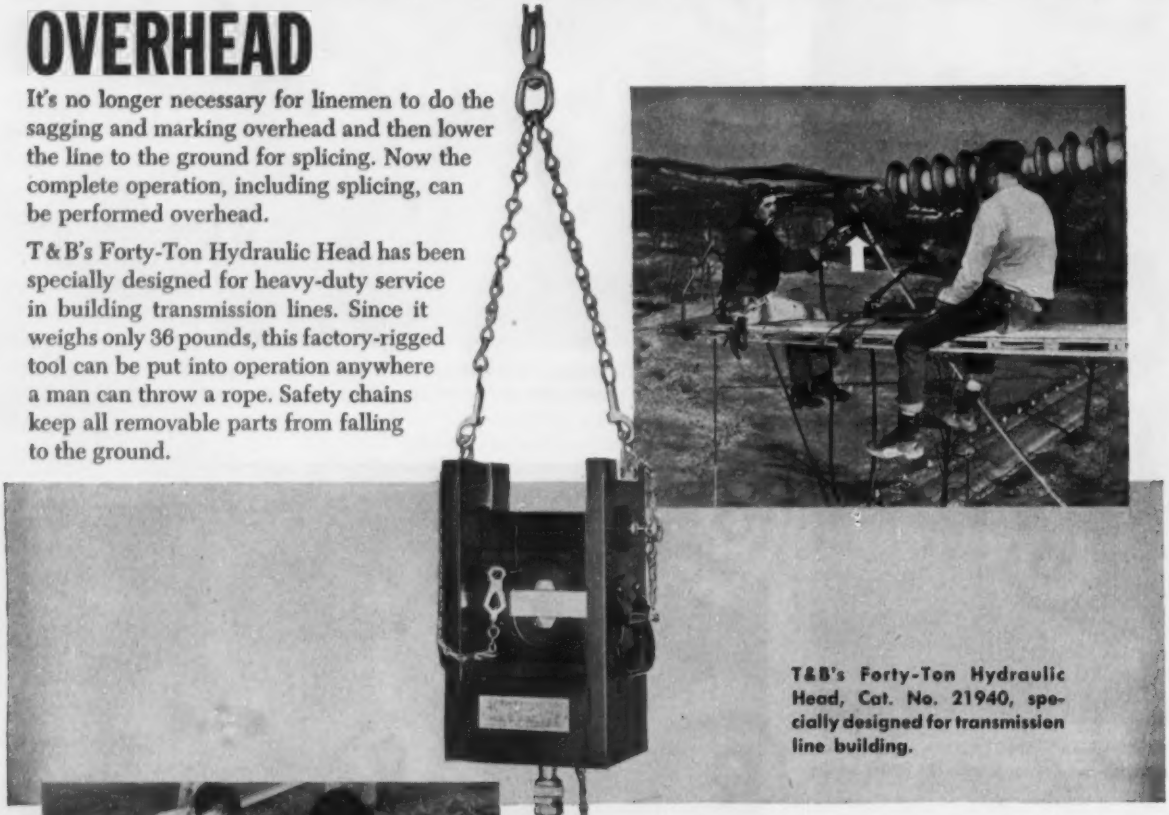
WORKMEN STRUNG two No. 8 wires from service pole to barnyard buildings (left). Feeder lines were put underground. Services remained overhead to allow for easy future changes

## Now *ONE* portable tool makes transmission line splices

# OVERHEAD

It's no longer necessary for linemen to do the sagging and marking overhead and then lower the line to the ground for splicing. Now the complete operation, including splicing, can be performed overhead.

T & B's Forty-Ton Hydraulic Head has been specially designed for heavy-duty service in building transmission lines. Since it weighs only 36 pounds, this factory-rigged tool can be put into operation anywhere a man can throw a rope. Safety chains keep all removable parts from falling to the ground.



T&B's Forty-Ton Hydraulic Head, Cat. No. 21940, specially designed for transmission line building.

# *or* ON THE GROUND

Demountable legs hold T & B's Forty-Ton Hydraulic Head at convenient working height when installations are being made on the ground. During operation, hardened steel dies compress fitting and cable hexagonally into one homogeneous mass . . . all in a few seconds. The same die set installs tension splicers, dead ends, loop splicers and taps, tees and terminals.

Modern hydraulic design has virtually eliminated the need for maintenance. However, field maintenance is simple and practical. The 21940 Installing Head can be completely disassembled and reassembled in less than one-half hour with these common tools: screw driver, Allen wrench, and mallet.

T&B Bulletin 70 gives a detailed description of the Forty-Ton Hydraulic Head as well as complete lines of T&B connectors, tools, and accessories for transmission line building. Send for FREE copy.

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# 3 Insulator Firms . . .

## . . . report progress. Victor adds posts. Lapp builds lab. Pinco starts plant addition

New testing, production, and research facilities, production by one company of its 10 millionth insulator, plant expansion, and new product developments have recently been reported by insulator manufacturers located in New York State.

Three firms located where the insulator industry was born are: Lapp Insulator Co, at LeRoy; Victor Insulator Co at Victor; and Porcelain Insulator Co at Lima.

Main insulator products of these plants include: pin, line post, station post, switch and disc types; and transformer and circuit breaker bushings. Voltage classifications range from 600 v to 230 kv.

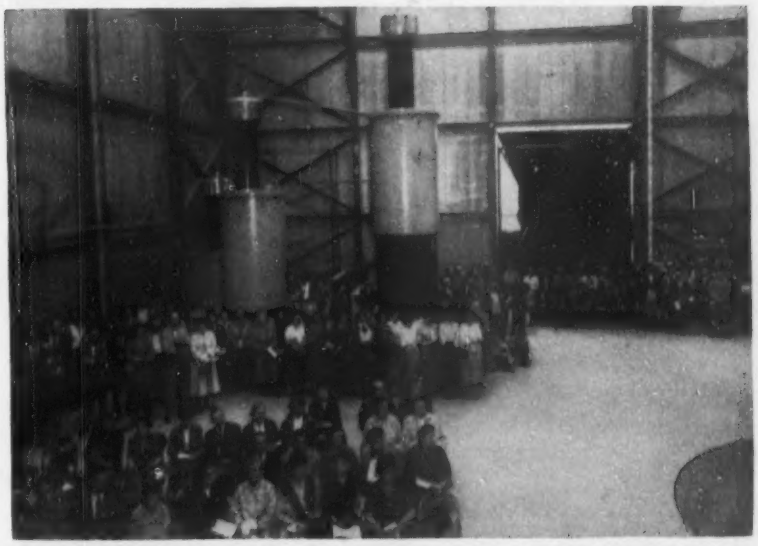
**Lapp Insulator Co . . .** This company dedicated its $500,000 John Lapp High Voltage Laboratory on Oct. 15. The single-story structure is 48 ft high and has a floor area of 16,200 sq ft. Three transformers connected in series will supply over 1 million v for 60-cycle testing. Impulse generator equipment will produce strokes rated at over 2.5 million v.

At the dedication ceremony Ralph Jenner, president, said, "At the present time there are several power lines under construction in this country, designed to carry electricity great distances at 330 kv. The new laboratory facilities now make it possible for Lapp to meet the requirements for insulators and equipment for such high-voltage use and to explore the growing field of high-voltage transmission."

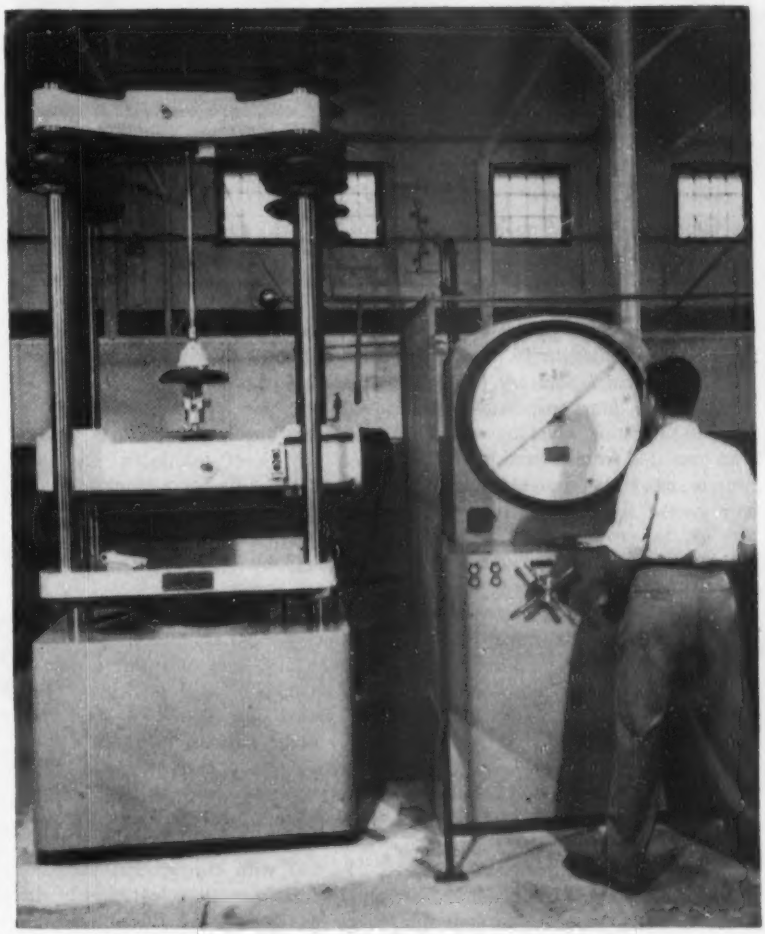
The laboratory is named in memory of John Lapp who founded the Lapp Insulator Co at LeRoy in 1916. The union representing the AFL employees of the company joined in the dedication ceremony by presenting a plaque bearing the likeness of Mr Lapp and carrying a fitting inscription.

New product developments include a large high-voltage porcelain bushing (112 in. high, 24 in. dia OD) for circuit breakers.

**Victor Insulators, Inc . . .** New testing and research facilities, departures in



JOHN LAPP HIGH-VOLTAGE LABORATORY of Lapp Insulator Co is dedicated. Equipment is available in lab for 1-million-v 60-cps testing and for 2.5-million-v impulse testing



NEW 120,000-LB TESTING MACHINE with insulated head is used in Victor Insulator's enlarged laboratory. H-V 60 cps applied to head goes down rod and over insulator to ground

GROUND IS BROKEN for Pinco's 25,000-sq ft plant addition by Pres Leo B. Harvey, left, and James H. Matthews, mayor of Lima and company's oldest employee in years of service

insulator designs, and an addition to the company's line have been announced by Vice Pres Howard Failmezger. The company was purchased less than a year ago by I-T-E Circuit Breaker Co, Philadelphia.

The electrical laboratory has been enlarged. A new installation is a 120,000-lb testing machine with the head insulated from ground by the apparatus insulators mounted on the four posts. Electrical testing up to 150 kv to ground can be applied simultaneously with the mechanical test. Another addition will be a 1-million v impulse generator which will be installed this month.

On the production line a new test rack was recently completed. This provides for routine 225 kv continuous testing.

Two somewhat unusual insulator designs have been developed for use in fog atmospheres. The pin type has a bowl at the bottom, increasing the length about 40% and extending close to the crossarms. This construction creates a dead air space around the pin. A suspension type has an underface with a similar radius to the top of the shell and a ridge at the outer edge to drain off the moisture.

An addition to the company's products is a series of line post insulators and station post insulators. These will be suitable for ranges up to and including 45 kv.

**Porcelain Insulator Co . . .** Production of its 10 millionth insulator, ground breaking for a plant addition, and recognition of its 34th anniversary made Oct. 21 a memorable date for the company.

The 10 millionth unit was of the suspension type glazed white, and mounting a chromium-plated cap and pin. It will become part of a display in the company's historical exhibit.

Ground was broken for a 25,000-sq ft plant addition to house a kiln, doubling plant capacity, and additional assembly and testing facilities. A warehouse will be erected in the near future.

Linked with the ground breaking ceremonies was the celebration of the 75th anniversary of Edison's invention of the incandescent lamp and the company's own 34th anniversary. Leo B. Harvey, president, led the observance which was attended by employees, by representatives of Joslyn Manufacturing & Supply Co and by members of the editorial staff of Electrical World.

## MANUFACTURING BRIEFS

**Silicone rubber,** SE-965, for general purpose wire insulation requiring no milling has been announced by General Electric Co's Silicone Products Dept. It can be easily fed into extruding equipment, needs no oven baking, and is low in cost compared with most silicone rubber compounds, according to GE engineers. SE-965 is claimed to have good shelf stability, good electrical properties, and can be tinted in colors.

**Vinyl resin,** pliovic EDB90V, for extruded wire insulation is announced by Goodyear Tire & Rubber Co. This pure polyvinyl chloride resin is the first in a series of electrical grade resins to be released by Goodyear. Pliovic EDB90V is suggested for T and TW general building wires and appliance wires, and also for cable jacketing.

**Plastic pipe** made by Reflin Co, Gardena, Calif., will be used for 10-in. condensate make-up lines by Los Angeles Department of Water and Power at its 512,000-kw Valley steam generating plant now under construction. The chemical treatment drain line will be 8-in. plastic pipe. The polyester resin, fibre-glass reinforced plastic pipe with smooth, seamless interior surface is expected to discourage attachment of mineral and biological deposits. The Reflin pipe was placed on the market after 3 years of research and development.

**Inductotherm Corp,** 620 E. Glenolden Ave, Glenolden, Pa. has been formed for the manufacture and sale of induction melting and heating equipment. Principal officers are Henry M. Rowan and Paul F. Foley. The company offers high-frequency motor-generator equipment with furnace capacities ranging from 5 lb to several tons. Capacities range from 5 kw to 1,250 kw. The equipment carries the trade name Inducto.

# *Insulator Prices*

## *vs.*

# *Insulator Performance*

So-called "bargain" insulators are supposed to cut costs.

That they do, but *first* costs only . . . and by only a few cents per insulator.

Price is hardly a measure of the long range performance which is naturally your first concern when considering insulators. For, as you know, price tag savings can be wiped out many times by failure of a single insulator on any of your transmission or distribution lines. Premium performance rarely comes at a bargain price.

Be safe! Invest in the traditional dependability of Locke Insulators.

**LOCKE**

LOCKE DEPARTMENT
GENERAL ELECTRIC COMPANY
BALTIMORE, MARYLAND

# TVA Spent $300-Million . . .

## . . . of the $333 million in funds available to the governmental agency for the fiscal year 1954 on power facilities

The Tennessee Valley Authority has released the financial portion of its fiscal 1954 annual report, showing that almost $300 million of the $333 million in funds available to the agency for the year were spent on power facilities.

In a 36-page tabulation of the agency's worth, funds it received and funds it spent, TVA Comptroller Gifford Cruze reported to General Manager Aubrey J. Wagner net revenue of $28,820,000 from fiscal 1954 operations represented a 3.2% return on average power investment.

**Income From Power Operations . . .** The report showed that TVA's $333,089,040 in funds for the year came from income from power operations ($51,100,460, including $28,140,957 net income, and $22,959,503 back provision for depreciation); $188,480,000 net appropriations; $113,204 property transfers; $74,200,474 decrease in cash; $19,421,215 increase in current liabilities, and $23,624 contributions in aid of construction. Of the total of funds available, $238,430,154 was spent on new construction of steam plants, $2,610,022 went into new dams and reservoirs, $56,465,778 went into other power facilities, $1,647,121 into chemical plants, $2,650,577 into other capital improvements, and slightly over $30 million into Treasury payments, reduction of funded debt and increases in receivables and inventories.

Other TVA financial items covered in the report:

• Fixed Assets—76% of which relate to power, 11% to navigation, and 13% to flood control. Largest item here is multiple-use dams, listed as worth $389,177,257, excluding depreciation reserves. Total power fixed assets are listed as $1,109,220,992, minus $140,855,811 reserves for depreciation. Total fixed assets for all classifications, including $316,497,134 construction in progress and investigations for future projects, is $1,629,688,540.

• Power program assets—these are given as $1,339,634,178, exclusive of general assets not segregated by programs and exclusive of construction in progress relating to multiple-use facilities projects for which cost allocation has not yet been made. Of this total, $313,259,056 represents construction and investigations in progress. TVA considers $1,084,445,937 of the total to be derived from Treasury funds, since it deducts $253,914,245 in accumulated net power income and other funds.

The agency said the average net investment in completed power plant plus allowances for power inventories, general plant used in the power program and working capital was approximately $890 million.

• Cost of completion—to complete the major dam and power projects under construction or authorized is estimated at about $390 million. This includes $128 million materials and services contracted for and not delivered as of June 30, 1954.

• Installed capacity—TVA said it increased the installed rated capacity of its system by 972,700 kw net during fiscal 1954. This came from:
• Hydro—30,000 kw, Cherokee Dam; 67,500 kw, Fontana; 25,000 kw, Boone; 36,000 kw, Fort Patrick Henry; 18,000 kw, Cumberland Basin projects-Dale Hollow; 13,000 kw, Aluminum Co of America dams.
• Steam — 112,500 kw, Widows Creek; 270,000 kw, Shawnee; 405,000 kw, Kingston.

• Administrative expense—$5,455,357 was listed as total administrative and general expense charged to power operations.

## Rate Changes in Alaska

Two rate changes have been instituted by the Chugach Electric Association at Anchorage, Alaska, following approval by the Rural Electrification Administration. The rate for hot water heating has been revised to increase the block of 250 kwhr at 2.5¢ per kwhr to a block of 350 kwhr at the same rate per kwhr. A change for commercial users will reduce the 5¢ block from 2,000 kwhr to 1,000 kwhr, thus shortening the 5¢ block by 1,000 and enabling the commercial user sooner to reach the co-op's cheapest block in its commercial rate.

## Latin America . . .

### . . . faces power shortage as U. S., foreign investors are hampered in utility investment

SAN JOSE, COSTA RICA (McGraw-Hill World News)—The nationalistic trend is slowly forcing out long-time U. S. and foreign investors in utility operations in Central America and elsewhere in Latin America. And many foreign investors claim it is the fault of easily available credits from the Export-Import Bank and the World Bank.

**Warned of Power Shortage . . .** One recent example is American & Foreign Power Co's subsidiary in Costa Rica, Compania Nacional de Fuerza y Luz (National Power & Light Co). A&FP warned Costa Rica several years ago of a forthcoming power shortage unless facilities were increased and offered several proposals for additional facilities which would have involved the investment of millions of U. S. private capital. But they received the cold shoulder on the basis that "we can do it ourselves."

Costa Rica now has a serious power shortage and the government—still of the same mind—is urgently getting its international finances in condition in order to be able to qualify for a World Bank loan to construct a hydroelectric plant—something that A&FP offered to do a long time ago.

The same situation existed in El Salvador, where a Canadian-owned electric company was not permitted to expand its facilities. As a result the country suffered from a power shortage for years. The government obtained a World Bank loan and constructed a hydroelectric plant and

ultimately will take over the Canadian investment. Similar situation extends to foreign owned railways, telephone systems, etc.

**Foreign Investors Being Forced Out** . . . Foreign investors insist that they are "ready, willing and able" to improve and expand utility investments in most Latin countries but the availability of credits from the Export-Import Bank and the World Bank (they even charge that there is competition between the two to extend loans) feeds the nationalistic trend and is slowly forcing them out.

These officials of foreign-owned utility companies claim that the record shows—and they back up their argument with convincing statistics—that in practically all cases, they operate their services at less expense and more efficiently to the public than do the government operated utilities.

## Cowlitz County, Wash., Budgets $3.4 million in '55

Cowlitz County, Wash., PUD commissioners place 1955 budget expenditures at $3,397,000 as compared with $3,290,000 in 1954 because of electric heating, television set gain and more large appliances on the system. PUD serves the southwest Washington industrial centers of Longview-Kelso.

PUD Auditor K. W. Durgan reported operation and maintenance are budgeted at $2.1 million as compared with $1.9 million for 1954 and the PUD expects to place $20,000 in working capital accounts compared pared with $10,000.

## FINANCIAL BRIEFS

**Quebec Power Co** will soon offer about 110,000 common shares to its stockholders on 1-for-5 basis. Shawinigan Water & Power Co, owner of some 58% of the outstanding shares of Quebec Power, has indicated its intention of subscribing for the full number of shares to which it will be entitled under the proposed offer . . .

**Sierra Pacific Power Co's** 34,807 shares of common stock offering has been oversubscribed.

# Today in Utility Finance

## YIELDS (%)

| Quality | Bonds | | | Preferred Stocks | | | Common Stocks | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1st | 2nd | 3rd | 1st | 2nd | 3rd | 1st | 2nd | 3rd |
| DATE | | | | | | | | | |
| **Oct. 28** | **2.88** | **2.90** | **3.11** | **3.88** | **4.00** | **4.37** | **4.63** | **5.06** | **5.36** |
| Oct. 21 | 2.88 | 2.90 | 3.09 | 3.86 | 4.00 | 4.36 | 4.57 | 5.00 | 5.30 |
| END OF QTR. | | | | | | | | | |
| 3rd 1954 | 2.88 | 2.90 | 3.10 | 3.89 | 3.99 | 4.38 | 4.50 | 4.80 | 5.19 |
| 2nd 1954 | 2.90 | 2.96 | 3.19 | 4.03 | 4.14 | 4.48 | 4.72 | 5.04 | 5.45 |
| 1st 1954 | 2.82 | 2.87 | 3.14 | 3.88 | 4.09 | 4.42 | 4.83 | 5.19 | 5.42 |
| 4th 1953 | 3.07 | 3.12 | 3.34 | 4.17 | 4.32 | 4.62 | 5.07 | 5.57 | 5.51 |

Data: Reis & Chandler, Inc.

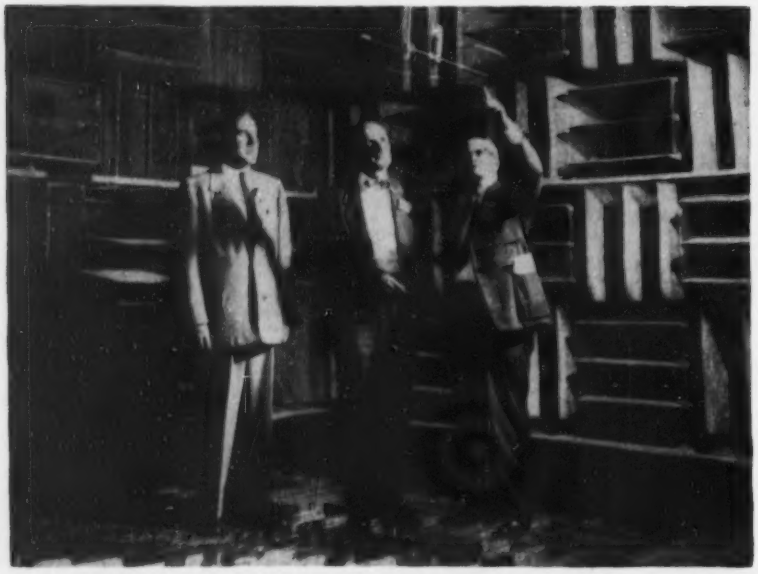
## EARNINGS

| Company | Period Months | Ended | Net Income 1954 | Net Income 1953 | Earnings Per Common Share 1954 | Earnings Per Common Share 1953 |
|---|---|---|---|---|---|---|
| Central Illinois Electric & Gas | 12 | Sept. | $1,962,496 | $1,895,017 | $2.10 | $2.08 |
| Central Power & Light | 12 | Sept. | 6,507,724 | 5,330,833 | ..... | ..... |
| Central & South West, consolidated | 12 | Sept. | 17,302,155 | 15,039,438 | 1.90 | 1.65 |
| Detroit Edison and subsidiaries | 12 | Sept. | 21,057,212 | 20,946,692 | 1.95(a) | 1.97(a) |
| Central Vermont Public Service | 12 | Sept. | 1,185,243 | 998,361 | 1.08(b) | 1.00(b) |
| Florida Power & Light | 12 | Sept. | 10,291,314 | 8,136,825 | 3.40(c) | 2.98(c) |
| Gulf Power | 12 | Sept. | 233,455 | 198,125 | ..... | ..... |
| Iowa-Illinois Gas & Electric | 12 | Sept. | 4,217,481 | 4,715,813 | ..... | ..... |
| Kansas City Power & Light | 12 | Sept. | 6,943,636 | 6,449,597 | ..... | ..... |
| Kentucky Utilities | 12 | Sept. | 5,566,437 | 4,842,768 | ..... | ..... |
| Lake Superior District Power | 12 | Sept. | 1,015,325 | 1,003,919 | ..... | ..... |
| Long Island Lighting | 12 | Sept. | 8,860,042 | 7,168,326 | ..... | ..... |
| Louisiana Power & Light | 12 | Aug. | 3,869,639 | 3,504,961 | ..... | ..... |
| Middle South Utilities, consolidated | 12 | Sept. | 16,037,017 | 14,136,458 | 2.25 | 1.98 |
| Montana Power and subsidiaries | 12 | Sept. | 7,488,897 | 7,702,607 | 2.59 | 2.72 |
| Niagara Mohawk Power, consolidated | 12 | Sept. | 26,798,098 | 26,054,606 | 2.04(f) | 2.05(f) |
| Oklahoma Gas & Electric | 12 | Sept. | 6,583,948 | 6,075,442 | 2.06 | 1.95 |
| Portland General Electric | 12 | Sept. | 4,146,632 | 3,700,759 | 1.38 | 1.23(g) |
| Tucson Gas, Electric Light & Power | 12 | Sept. | 1,783,617 | 1,554,589 | 1.62 | 1.41 |
| Virginia Electric & Power | 12 | Sept. | 15,576,274 | 12,610,868 | 2.22(h) | 1.90(h) |

Notes—(a) Based on shares outstanding at end of period; (b) Based on 867,141 shares in 1954 and 788,510 shares in 1953; (c) Based on 2,695,000 shares in 1954 and 2,450,000 shares in 1953; (f) Based on 11,556,036 shares in 1954 and 11,306,036 shares in 1953; (g) Revised to give effect to the 2-for-1 stock split, effective April 22, 1954, and (h) Based on 5,999,980 shares in 1954 and 5,441,034 shares in 1953.

## FINANCING

| Company and Description | Amount of Offering (000) | Offering Price | Yield to Public |
|---|---|---|---|
| WEEK OF OCTOBER 28—NOVEMBER 3 | | | |
| None | | | |
| SCHEDULE FOR NOVEMBER—DECEMBER | | | |
| **Bonds** | | | **Bid Date** |
| Sierra Pacific Power—1st mtg due 1984 | $4,000 | ..... | Nov. 9 |
| New Orleans Public Service—1st mtg due 1984 | 6,000 | ..... | Dec. 14 |
| Kansas Power & Light—1st mtg due 1984 | 8,000 | ..... | ..... |
| **Preferred Stock** | | | |
| Interstate Power—200,000 sh $50 par | $10,000 | ..... | Nov. 30 |
| Mississippi Power & Light—44,476 sh $100 par (to be offered in exchange for outstanding $6 pfd on a sh-for-sh basis, plus a cash difference between initial public offering price of new shares and redemption of the old shares) | ..... | ..... | ..... |
| Black Hills Power & Light—9,950 sh $100 par cum | 995 | ..... | ..... |
| Black Hills Power & Light—about 40,000 sh $25 par | 1,000 | ..... | ..... |
| **Common Stock** | | | |
| Virginia Electric & Power—600,000 sh (to be offered common-holders on 1-for-10 basis, record Nov. 23 with an over subscription privilege) | ..... | ..... | Nov. 23 |
| ISSUES RECENTLY POSTPONED | | | |
| **Bonds** | | | |
| Gulf States Utilities—1st mtg due 1984 | $24,000 | ..... | ..... |
| Consolidated Edison Co of N. Y.—1st mtg due 1984 | 50,000 | ..... | ..... |
| **Preferred Stock** | | | |
| Gulf States Utilities—160,000 sh $100 par cum | 16,000 | ..... | ..... |
| UNSCHEDULED AND/OR UNDER CONSIDERATION | | | |
| **Bonds** | | | |
| Long Island Lighting—1st mtg | $15,000 | ..... | ..... |
| Connecticut Light & Power—1st mtg | 10,000 | ..... | ..... |
| Kentucky Utilities—1st mtg | 15,000 | ..... | ..... |
| Kansas City Power & Light—1st mtg | 16,000 | ..... | ..... |
| **Preferred Stock** | | | |
| Black Hills Power & Light—10,000 sh $100 par | $1,000 | ..... | ..... |
| Central Power & Light—75,000 sh $100 par | 7,500 | ..... | ..... |
| **Common Stock** | | | |
| Kentucky Utilities—about 228,678 sh (to be offered common-holders on about 1-for-10 basis) | ..... | ..... | ..... |



ELECTRICAL EQUIPMENT COMMITTEE Vice Chairman H. E. Deardorff, right, and Chairman C. L. Derrick, center, question W. S. Ginn, general manager of the Power Transformer Department, about the microphones in General Electric's new sound laboratory at Pittsfield, Mass.

# Connecticut Utilities Cooperate

**EEI Equipment Committee told that four companies will build joint generation facilities. Swedish dc line described fully**

Highlight of the Edison Electric Institute Electrical Equipment Committee meeting at Hartford, Conn., Oct. 11-12, was revelation by Vice-Pres C. T. Hughes, Connecticut Light & Power, of a plan by which his company will co-operate with three others in planning capacity for the future. Other participants are Connecticut Power Co, Hartford Electric Light Co, and United Illuminating. Their combined systems serve most of Connecticut's million kw load.

Objective of the plan, said Hughes, is to provide generation and transmission facilities for each company at the lowest cost consistent with good service. An important contribution to this is generating units larger than any individual member of the group could justify for its system alone. But distribution and internal transmission were not included in the survey.

**Study Three Aspects . . .** A committee comprised of representatives of all member utilities studied the problem in three steps, Hughes continued. Load forecasts evaluated national data in terms of Connecticut experience, determined that 5% compounded load growth was probable, and projected that trend to 300% load in 1975. Primary purpose of this long-range plan is acquisition of station sites and rights-of-way and to coordinate interim additions to plant.

Power production studies determined that units upwards of 100 Mw should be installed. But development of new sites should be delayed as long as possible. Basic assumptions, said Hughes, were 15% reserve or coverage of largest unit and coal for fuel. Transmission was coordinated with generation estimates, taking advantage of existing lines and substations and existing rights-of-way.

**Compliments for Cooperation . . .** Discussion complimented the "complete unselfish cooperation" of four independent utilities. Said one, "If (such projects) had been done in the past, holding company legislation might have been different."

Experience with the high voltage dc cable link to Gotland may lead to adoption for the transmission between Sweden's hydro installation in the far north and loads in the south, reported Technical Director Ivar Herlitz, ASEA, Sweden. Grid control gives almost instantaneous control of both rectifiers and inverters, he said, and the system can handle power flow in either direction. Similar methods have been proposed for the England-France interconnection. Use of dc transmission for this link, said Herlitz, would avoid trouble from frequency differences between the two systems connected by the line.

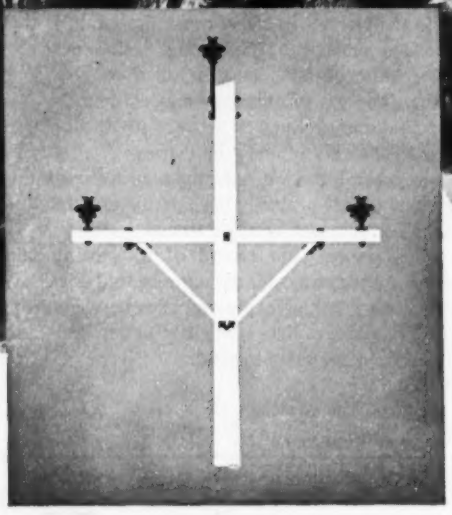
When to schedule generator rewinding remains a debatable question. Insulation tests on a 30-year-old machine at Hartford gave unexpected results, reported D. C. Switzer. Discussion disclosed varied opinion about test methods and interpretation of results. And a poll of the group indicated preference for dc among utilities which use periodic tests, but almost as many which do not consider regular testing necessary. One representative questioned the desirability of rewinding before failure, but C. L. Derrick, Hartford, noted that the value of kvar capacity gained in the new winding justified the expenditure of this considerable sum.

## Urges $20-Billion Overhaul

The 53rd annual convention of the National Electrical Contractors Association in New Orleans has been told the U. S. economy needs a $20 billion electrical modernization job. Association Pres Don B. Clayton, Sr, estimated this would bring in another $250,000 a year to each of the 3,389 NECA members, who now average $375,000. Clayton said fewer than 2 million of the 47 million residential units have adequate wiring.

## Middletown Station on Line

Hartford Electric Light Co's new 66,000-kw generating plant has gone into operation at Middletown, Conn. Plant will serve interconnected systems of the Hartford utility and Connecticut Power Co.



**Type 401**
**Triangular structure***

| Quantity | Description |
|---|---|
| 1 | Crossarm |
| 1 pr | Wood crossarm brace |
| 2 | Washerhead bolt ½" w/sq. nut and flanged 3" x 3/16" washer |
| 3 | Pin type insulator |
| 1 | Curved shouldereye bolt ⅝" w/washer |
| 2 | Crossarm pin long shank |
| 3 | Machine bolt ⅝" w/locknut |
| 2 | Curved washer 2¼" sq. |
| 1 | Washer 2¼" sq. x 3/16", 13/16" hole |
| 1 | Spring washer ⅝" |

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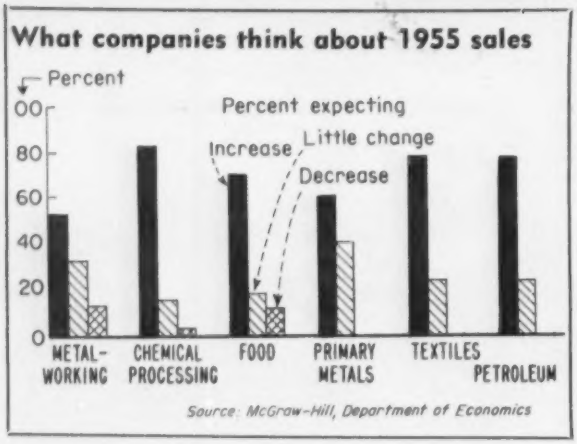



# Business Foresees Sales Rising in 1955

There is encouraging news for electric utilities in the results of the McGraw-Hill survey of business' preliminary capital spending plans for 1955 (p 6). The survey was just completed by the McGraw-Hill Department of Economics.

According to preliminary plans industry will invest just 5% less next year than in 1954 in new plants and equipment. That implies a level of capital investment just 11% lower than the record level of 1953—and that's an amazingly small drop from such a boom as we've had in the past few years. A high level of capital investment contributes important strength to general prosperity and thus obviously benefits utilities.

**Increased Sales in 1955 Predicted . . .** And there's another good sign for utilities in the survey results. It is in the answers that companies gave to a question about their expected sales next year. By a strikingly heavy majority business answered that it thought sales would pick up in 1955.

About 65% of all companies that answered this question said that they expect an increase in sales next year. Only 8% indicated that they expect sales to decline. The rest, 27%, think that sales will be about the same in 1955 as in 1954.

Sales expectations are even more optimistic in most of the manufacturing industries that are heavy consumers of electric power. The chemical industry is an outstanding example. Chemical companies use about 15% of all electricity consumed by industry. And 84% of chemical companies surveyed think that sales will increase next year. Only 6% see a decline. Two other industries that fall in the broad classification of "chemical processing" industries are even more optimistic about sales. Fully 91% of the rubber and pulp and paper companies expect sales to increase. And none expects a decline.

Together, the chemical processing industries (excluding petroleum refining) use about 30% of all electric energy consumed by industry. And 83% of the companies in this group reported that they expect sales to increase in 1955.

Steel is one exception to the trend of majority expectations of increased sales. Only 45% of steel companies think sales will increase in 1955. But none of the companies think they will decline—55% expect sales about the same as in 1954.

And the nonferrous metals companies—which now probably use more electric energy than the steel companies—voted 71% for higher sales, only 29% for sales about the same as this year.

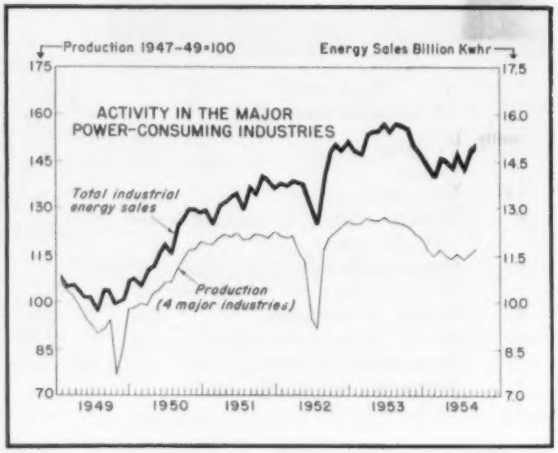
There are two significant limitations on using these reports of sales expectations for forecasting purposes. One is that companies did not report how much they thought sales would change—only the direction of change. So any forecaster still has to make up his own mind about the extent of industrial recovery in 1955.

**How Good Is the Survey . . .** The other limitation is that, after all, the companies may be wrong, just like anyone else. But three sets of facts may be cited to give some strength to these reports of company expectations.

**1.** Their expectations pretty well agree with the observations of outside students of their industries.

**2.** They are in general, the larger companies in their industries—which means they probably have pretty good facilities and personnel for forecasting sales trends.

**3.** They have a pretty good record of forecasting sales for this survey. Last spring, manufacturers told McGraw-Hill that they thought their company sales would decline by about 2% in 1954, which is slightly under, but close to the decline based on sales to date.



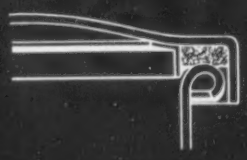
# TOPS IN BOTTOMS

Distribution transformers are subject to weather and handling hazards both on the line and in storage. Constant exposure to abuse from man and weather makes protection difficult. Transformers are particularly vulnerable at the base, where moisture from condensation or rain will cause rust that attacks any unprotected point.

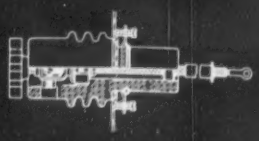
Moloney HiperCore Transformers are *tops in bottoms.* Their rugged shells are designed to stay in use despite weather and abuse. Moloney HiperCore Transformer Tanks are protected against rust forming at the base weld . . . and feature a rolled lip which prevents deterioration from weather or water. The tank base is first pressed into the shell and is bonded into a unit by a continuous seam weld. The inside edge, the only point where water might stand, is coated with a sealing mastic and rolled in, forming a lasting barrier against moisture, air, and the ravages of rust.

So, give your distribution system the advanced engineering, design, and fabrication that is synonymous with Moloney Products *all along the line.*

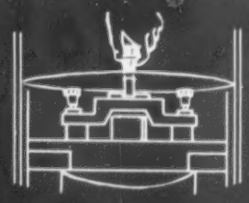
ME54-29



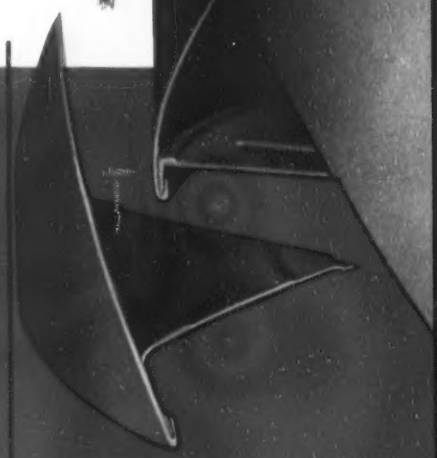
Corprene gasket retained by ring welded to tank cover. Gasket is retained in position forming a perfect tank seal. Gasket is not cemented and can be used again and again.



Moloney sidewall mounted high voltage bushings are provided with a molded, high impact resistant phenolic-cold rubber protective cap for working "hot"



Tap changer operating handle located above hot oil level. Double-moving contacts snap into position with a wiping action that assures positive contact.



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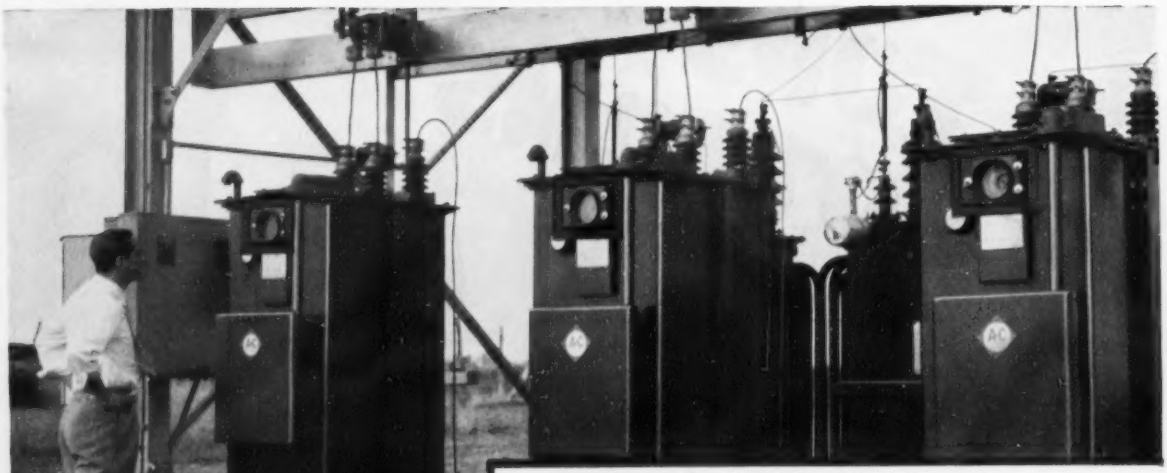
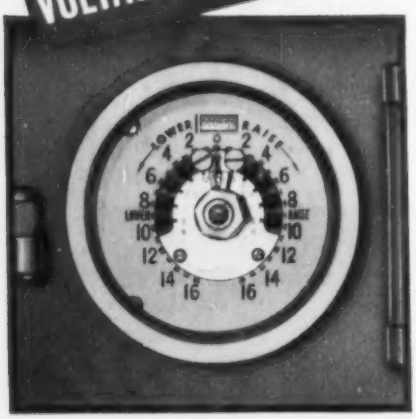


ALLIS-CHALMERS
5/8% STEP
VOLTAGE REGULATORS




**Three Easy Steps—**

**Change Ratings**

1. Open Window
2. Place Limit Switch Pins in Desired Positions
3. Close Window

**Utility Engineer Says:**

## *"Vari-Amp Feature Lets Relay Man*

# Change Ratings on Two Regulator Banks In 15 Minutes"

NO NEED to take regulators out of service when you change ratings on an Allis-Chalmers single-phase power regulator. Three simple steps is all it takes to do the job fast. They replace the 10 complex, time-consuming operations required for other types of regulators. There are no electrical connections to make — no complicated adjustments.

### Five Ratings in a Single Regulator

In addition to simplifying operation, the *Vari-Amp* feature provides five ratings in a single regulator. You can meet regulation requirements at less expense in most cases. When loads grow, changes cost less because range of regulation can be reduced proportionately instead of being cut in half as with other regulators. Extra short-circuit capacity is available, too.

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A-4460

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